URBAN SUSTAINABILITY REVIEW AND STRATEGY 2040

KALAY

Kalay Urban Sustainability Review and Strategy 2040
June 2020

ACKNOWLEDGEMENTS

The Urban Sustainability Review and Strategy for Kalay builds on the work and developed material by a large number of participants during the SymbioCity Capacity Building Programme from various authorities, departments, organisations, academia and civil society. Experts involved during the training sessions in Myanmar were from Yangon Technical University, UN-Habitat and Sweco.

This summary report was developed by the following team:
Main authors: Helena Ohlsson (SKL International) and Vishnu Prasad (SKL International)
Contributors: Björn Ekelund (SKL International)
Reviewers: Daw Sabe Pyu Lwin (URDI) and Zaw Myo Oo (URDI)

Cover photo: Helena Ohlsson
Design of maps and illustrations: Sylvia Platteeuw and Kailun Sun (Warm in the Winter)
Layout: Hein Thu

URBAN SUSTAINABILITY REVIEW AND STRATEGY 2040

KALAY

CONTENTS

FOREWORD
DUHD

The urban population in Myanmar is growing faster than the country's population as a whole which put a large pressure on existing urban services and infrastructure. There is an urgent need for support to sustainable urban planning, development and management in Myanmar. The task of promoting more sustainable urban areas is shared between a number of stakeholders, where there is a need to strengthen Capacity institutionally, organizationally as well as by strengthening individual capacities.

The Department of Urban and Housing Development (DUHD) of the Ministry of Construction (MOC), is the responsible government agency for urban and housing sector development in Myanmar. During the last years, there has been a strong focus to develop new priority programmes to ensure the achievement of a sustainable urban future in Myanmar. These include the Million Houses Programme, the development of the National Urban Policy, a new Urban and Regional Development Planning Law, Housing Development Law, Guidelines for Urban–Rural Linkages and better connectivity and Guidelines for Mainstreaming of Climate Change into the development agenda.

As a response to the great needs to address the issue of urban development in Myanmar including the need to capacitate key functions in the urban sector, MOC established the Urban Research Development Institute (URDI) by the support of UN-Habitat. Based on the platform of URDI, the SymbioCity Capacity Building Programme has been implemented since 2017 through the collaboration between SKL International, DUHD and MOC. The 3-year program funded by Sida, has been successfully implemented in the cities of Dawei, Kalay and Kalaw, in the states/regions of Tanintharyi, Sagaing and Shan, cities with different opportunities, potential and challenges.

The programme was specifically designed to support the Capacity enhancement aiming to build a Capacity of stakeholders at both national and local level, for better sustainable urban development with strong focus on social inclusion and participation. The programme has provided around 200 participants with hands-on "learning by doing" training experiences and initiated a cross disciplinary approach to urban planning and development that can function as 'good model for urban planning' for further spreading in Myanmar. The Town Planning process has been enriched by the SymbioCity Programme and its inclusive and sustainable approach to urban planning. Participants in the programme have had great achievements of understanding the SymbioCity Approach and acknowledge integrated spatial, environmental, socio-cultural, and economic development. Core group participants from each town and high level officials have had the great opportunity to study visits to projects in Sweden to learn about integrated spatial and institutional solutions including aspects of e.g. the Swedish Municipal system and administration, development of public spaces and green spaces, participatory processes, public housing, social inclusion, cultural heritage, urban agriculture, flood management, sustainable mobility and urban transformation.

On behalf of DUHD of MOC I would like to express my gratitude to the Swedish Government, Sida, SKL International, Experts from Malmö Municipality, Sigtuna Municipality, Umeå Municipality, Uppsala Municipality, Town of Stockholm, Yangon Heritage Trust, the Remote Sensing and GIS Research Center at Yangon Technological University, One Map Myanmar and all stakeholders who have been involved. We look forward to further strong cooperation and a sustainable and socio-economic development of cities in Myanmar.

AYE AYE MYINT
Deputy Director General
Department of Urban and Housing Development
Ministry of Construction
The Republic of Union of Myanmar

FOREWORD
URDI

The Urban Research and Development Institute (URDI) was established as a response to the great need to address the issue of urban development in Myanmar, including the need to capacitate key functions in the urban sector. The long-term ambition of URDI is to become the main hub for research and Capacity building in the urban sector in Myanmar.

The SymbioCity Approach is an integrated and holistic approach to sustainable urban development, based on extensive experience in Sweden and developing countries. It considers different functions and systems in relation to one another, and involves all relevant stakeholders, in order to achieve synergies. Cities and towns include various systems and functions that are of crucial importance for socially, economically and ecologically sustainable urban development. Synergetic solutions that solve several problems at once are often more cost-effective and sustainable. The SymbioCity Capacity Building Programme has addressed critical Capacity and institutional gaps that currently constrain the Department for Urban and Housing Development (DUHD) and the Urban Research and Development Institute (URDI) from effectively managing growth.

Since the SymbioCity Capacity Building Programme encourage and support multidisciplinary cooperation among stakeholders and an integrated approach, it builds a mutual sharing of knowledge and experience, primarily at local government level. It has also served as a basis for dialogue and cooperation between stakeholders at not only local level but also regional and national institutions, town planners and trainees are now able to guide urban sustainability reviews at different levels, using a combined multidisciplinary and sector approach. the SymbioCity Capacity Building Programme includes study visit to Sweden for core members in each township. It is thematically oriented towards introducing the Swedish governing system and the municipal responsibility of planning sustainable and inclusive cities. The study visits included aspects of the Swedish Municipal system and administration, development of public spaces and green spaces, participatory processes, social inclusion, cultural heritage, urban agriculture, sustainable mobility and urban transformation.

In summary, the SymbioCity Capacity Building Programme has been an opportunity for us to learn about good international practices. The programme is considered a key success factor for integrated development of urban sustainability and is required at all levels. This program has had a strong impact at the national level and regional level urban practices in Myanmar, supporting cities and towns to plan practical and integrated system solutions for sustainable urban development.

DR. SABE PYU LWIN
Deputy Director
Urban Research and Development Institute (URDI)
Department of Urban and Housing Development (DUHD)
Ministry of Construction

FOREWORD
KALAY TEAM

The SymbioCity Capacity Development Programme was jointly organized by the Department of Urban and Housing Development, the Urban Research and Development Institute and SKL International with the financial support of the Swedish International Development Cooperation Agency (Sida) in Kalay, Sagaing Region during the year of 2018-2019. As a part of the Programme, 4 trainings, 3 in Kalay and 1 in Sweden were conducted.

On behalf of the Kalay participants, I would like to express my deep sense of gratitude to responsible officials from the Department of Urban and Housing Development, responsible staff and trainers from SKL International, directors general from respective ministries and departments who allowed us to join the Programme, Sagaing Region Government and the chairs of Kalay District and Township Management Committees for the opportunity to be part of a very valuable programme.

The programme integrated both theory and practice and contributed to the development of our region. As a result of the program, some activities and plans are now being implemented to achieve the vision set collectively by all the participants of the Programme, "By 2040 Kalay Town is a transport hub and trade centre which is resilient to disasters, by engaging all residents in the town in governance and by focusing on proper management of natural resources and human resources development".

The training in Sweden took place from 31st August 2018 to 8th September 2018 and the participants could observe urban development plans in the cities of Sweden, urban planning approaches, climate change adaptation, the role and exhibitions of ArkDes - Sweden's national centre for architecture and design, and most importantly, flood prevention measures. Moreover, it gave us opportunity to study the extensive public transport system, the planning monopoly of municipalities of Sweden, elderly care, day care and education services, strong health care system, water supply and waste water management, public rental housing policy, government expenditures and tax collection, waste disposal system, environment conservation and the division of roads into separate lanes for motor vehicles, bicycles and pedestrians. This experience was very valuable for us to apply in our work for sustainable urban development locally and nationally.

Again, let me extend my gratitude to the trainers and organisers of the SymbioCity Capacity Building Programme, the training coordinator, Dr. Sabe Pyu Lwin, who made every effort for the smooth delivery of the training and the study tour, and all the other responsible officials who arranged everything necessary for travel, accommodation and food for the participants during the study tour to Sweden.

U THAN NWE
Deputy Director
Planning Department

EXECUTIVE **SUMMARY**

This document brings together the work conducted during the SymbioCity Capacity Building Programme and provides a knowledge base and strategy for future development of Kalay. The programme focused on improved capacity for urban planning, urban design, urban development and urban management with broad participation of stakeholders from local, state/region and union level.

The multi-sectoral core team of the programme with representatives from local, regional and national authorities has been working together to jointly define the existing situation, aspirations and the way forward for a more inclusive and sustainable urban development.

The report identifies the current situation through sustainability challenges and opportunities, aspirations for the future through vision and objectives as well as the way forward through project proposal for the strategy period of 2040. The identified vision aims to create a sustainable development of Kalay with specific focus on the balance between urban and rural development, economic development, greenery and resilience towards natural disasters as well as improved social infrastructure and participation. The participants in the programme have worked extensively with different tools and methodologies for improved analysis of the needs and challenges in the town that would be met by the proposed development strategy.

Specific proposals have been developed for the thematic areas of sustainable mobility, social infrastructure, economy and trade, urban-rural linkages as well as green/blue infrastructure and disaster risk reduction.

1. BACKGROUND

The political and institutional changes in Myanmar in recent years has stimulated urbanization and the number of people now moving from rural to urban areas is growing rapidly. This increases the pressure on existing urban services, infrastructure and socio-economic aspects, as well as the institutional mechanism and planning capacity for sustainable urban development in the country. Many sectors of the urban environment already suffer from poor infrastructure and management inefficiencies, such as water supply, sanitation, drainage, wastewater and solid waste management. Myanmar is also vulnerable to natural disasters which calls for resilience measures in urban environments. In addition, conflict sensitive urban planning can contribute both to the democratic development as well as peacebuilding in the country. While capacity constraints will continue to impact the functioning of the local level, several examples from around the world suggest that greater political decentralisation leads to better governance outcomes in cities which is a strong reason to continue the capacity building and infrastructure investment support to local level. To address the urban challenge, there is a need to develop solutions which will tackle the numerous urban problems in an integrated, sustainable and holistic approach.

SKL international manages the SymbioCity Approach 2.0 Programme, funded by Sida, lasting from December 2015 to December 2020. One component of the programme is the Capacity Building Programme in Myanmar. The Programme has been implemented in three townships in Myanmar – Dawei, Kalay, and Kalaw. In collaboration with the Urban Research and Development Institute (URDI) of the Ministry of Construction, the programme aims to build capacity towards sustainable and inclusive urban development.

This document presents the result of the programme in Kalay and is a joint work between all stakeholders involved throughout the process. The capacity building activities of the programme in Kalay were conducted during the period of 22nd of January 2018 to 7th of February 2019.

1.1 What is an Urban Sustainability Review and Strategy?

An Urban Sustainability Review (USR) is both a process and a product. It is a process for jointly exploring urban areas from a holistic perspective; an inclusive way of selecting and describing key issues which the town needs to address in development strategies, and key assets and opportunities, which should be leveraged in development projects and actions. It provides a platform for open and transparent discussions and consultations on matters of local attention by several stakeholders, as well as relations to global policies such as the Sustainable Development Goals (SDGs) and the New Urban Agenda (NUA). This report presents the findings and conclusions of the process. In addition, the report sets out the Strategy for a more sustainable future in Kalay through a 20-years perspective while making use of existing assets. For specific information from each training session, see the workshop documentation documents.

Figure 1: The conceptual model of SymbioCity, integrating the perspectives of socio-cultural, environmental and economic sustainability through improved urban systems, developed institutions and spatial improvements.

1.2 The SymbioCity

The SymbioCity is a concept for sustainable urban development with emphasis on improving living conditions for citizens, through the involvement of various actors and disciplines. It integrates economic, environmental and socio-cultural dimensions; it includes a gender perspective and promotes synergistic relations. It is a way of working with urban development and provides guidance and tools to support sustainable urban development processes.

The SymbioCity does not provide ready-made solutions to all urban challenges. Instead it offers a holistic, inclusive and integrated methodology for successfully working with sustainable urban development with broad stakeholder involvement and is a way of moving from ideas into action.

SymbioCity supports cities and urban areas in developing in a more sustainable and inclusive way and put people in the centre of development. To improve the health, safety, comfort and quality of life for the people who live there, e.g. to provide urban services like waste management, mobility and water more effectively. And to capture the economic and ecological potential that urbanisation brings while protecting the urban environment.

The approach works from visions and strategies, through integrated urban planning to urban improvements, innovative solutions and strengthened management of urban areas.

SDGs and NUA

Both the Sustainable Development Goals (SDGs) of Agenda 2030 and the New Urban Agenda (NUA) recognize the significance and potential of urbanization for a sustainable future by stressing the importance of a holistic, integrated and inclusive approach to urban development. The importance of local authorities in coordinating holistic planning and finding systemic urban solutions together with public, private and academic actors is thus crucial for the achievement of the SDGs. SymbioCity aims to support this development by providing tools that move from displaying what needs to be done to show how to move into action and achieve the goals, without compromising a strong foundation on local realities and pre-requisites. The core focus of the approach is to support implementation of SDG 11 Sustainable cities and communities: Make cities and human settlements inclusive, safe, resilient & sustainable. A pre-requisite in any urban planning process is to ensure establishment of strong local institutions that enables accountable, responsive and inclusive decision making processes through participation of stakeholders and partnerships with public, private and academic actors. SDG 16 Peace, justice and communities: Make cities and human settlements inclusive, safe, resilient & sustainable. A pre-requisite in any urban planning process is to ensure establishment of strong local institutions that enables accountable, responsive and inclusive decision making processes through participation of stakeholders and partnerships with public, private and academic actors. SDG 16 Peace, justice and strong institutions and 17 Partnerships for the goals are therefore integral as institutional components in all SymbioCity projects. To acknowledge urban complexity, the procedure includes local assessments of urban thematic and perspectives including poverty reduction (SDG 1), gender equality (SDG 5), clean water and sanitation (SDG 6), affordable and clean energy (SDG 7), industry, innovation and infrastructure (SDG 9), reduced inequalities (SDG 10), responsible consumption and productions (SDG 12), climate action (SDG 13), life below water (SDG 14) and life on land (SDG 15).

Figure 2: The SymbioCity integrates several of the Sustainable Development Goals into the working process.

1.3 SymbioCity Myanmar

The SymbioCity Myanmar Capacity Building Programme in Myanmar targeted a critical mass of stakeholders at Union, State/Region and Township levels, building Capacity through trainings, workshops and exposure visits. The Capacity building activities were structured around existing challenges and opportunities, and provided hands-on experiences of different approaches to urban planning, development and management. In total, each township underwent four rounds of one-week-training including an exposure visit to Sweden. The initiative has been anchored within the Ministry of Construction (MoC), Myanmar. The MoC has developed a 5-year plan for urban Capacity building in Myanmar that takes its point of departure from the Urban and Regional Planning Law. Operationally, the programme was implemented with the Urban Research and Development Institute (URDI) as its main platform. URDI, housed within the Department of Urban and Housing Development (DUHD) has been developed as a response to the great need to address the issue of urban development in Myanmar, including the need to capacitate key functions in the urban sector. The work in each township has been strongly linked to the Town Planning process. Under the current administrative structure, the town plan is meant to be the document that guides the sustainable urban development of a town.

Project organisation

In Kalay, a core team of 20 participants have been leading the work and participating throughout the whole Capacity Building Programme. The 4 training sessions have been led by international and national SymbioCity facilitators. Additional participants from civil society, academia, private sector or other relevant institution and experts have been engaged in different parts of the programme. During training session 1 and 2 a larger number of participants were joining the training sessions. The core team has continually engaged stakeholders through secondary data collection, field visits, participatory events, group discussions and interviews with various key informants. During session 2, Dr Kyaw Zaya Htun from Yangon Technical University and Mr. Shashank Mishra from UN-Habitat were invited to give guest lectures on GIS and DRR. In session 4 Mr. Carsten Staub from Sweco was invited as expert for Flood management. During session 3 in Sweden, a half day workshop and panel discussion on the development of Kalay was held together with the Myanmar High Level Officials delegation.

Core Team Kalay			
1.	Daw Thant Wai Kyaw	Member of Parliament	Kalay, Sagaing Region
2.	U Tun Naing Kyaw	Director	DUHD (Nay Pyi Taw), Ministry of Construction
3.	U Kyaw Kyaw Linn	Deputy Director	DUHD (Sagaing Region), Ministry of Construction
4.	U Thein Htike	Assistant Director	DUHD (Kalay Drstrict), Ministry of Construction
5.	U Than Nwe	Assistant Director	Ministry of Planning and Finance
6.	Daw Thin Thin Tun	Assistant Director	DUHD (Nap Pyi Taw), Ministry of Construction
7.	Daw Eain Nann May	Assistant Director	DUHD (Nap Pyi Taw), Ministry of Construction
8.	Awi Cin Kim	Assistant Engineer	DUHD (Sagaing Region), Ministry of Construction
9.	U Kyaw Kyaw San	Staff Officer	General Administration Department
10.	U Thura Zaw	Staff Officer	Irrigation and Water Utilization Management Department
11.	U Arkar Htet Naing	Staff Officer	Department of Urban and Housing Development
12.	Daw Su Kyi Soe	Sub-Assistant Engineer	Department of Rural Development
13.	Daw Aye Myat Mon	Sub-Assistant Engineer	Department of Rural Development
14.	U Khan Za Kam	Junior Executive Officer	Department of Agricultural Management and Statistics
15.	U Htein Win	Sub-Assistant Engineer	High Way Department, Ministry of Construction
16.	U Van Lian Thang	Sub-Assistant Engineer	Directorate of Water Resources and Improvement of River System
17.	U Myat Min Kyaw	Sub-Assistant Engineer	Ministry of Electrical Power
18.	U Kyaw Kyaw Soe	Deputy Staff Officer	General Administration Department
19.	U Win Zaw Oo	Deputy Staff Officer	Township Development Committee
20.	Daw Tin Tin	Junior Executive Officer	DUHD (URDI), Ministry of Construction
Facilitating Team			
1.	Daw Sabe Pyu Lwin	Deputy Director	URDI
2.	Helena Ohlsson	Programme Manager and Urban Specialist	SKL International
3.	Vishnu Prasad	International Programme Coordinator	SKL International
4.	Khine Yin Htun	National Programme Coordinator	SKL International
5.	Björn Ekelund	SymbioCity Trainer	SKL International
6.	Daw Mya Mya Thet	Translator	SKL International

Methodology and programme setup in Kalay

The work of the core team was conducted during the 4 training sessions with deeper studies and implementation of the methodology in between the sessions. The situation in the specific town has been the point of departure for the trainings, to open up for the possibility to work with specific ongoing development in Kalay. Principles of sustainability, poverty reduction, gender equality, public participation and transparency/ accountability have been included aspects. The work builds on additional analysis and data collection for improved decision making and informed decisions. The following image shows the division of work and thematic aspects in each of the 4 training sessions.

Opening Ceremony TRAINING SESSION 1
22-26 January 2018

Theory:
- SymbioCity Process
- Sustainable development

Practical Work:
- Challenges and opportunities
- Stakeholder analysis
- Vision and objectives
- Development scenarios
- Overall development proposals
- Strategy for implementation

TRAINING SESSION 2
21-25 May 2018

Theory:
- Urban planning and policy
- GIS and data analysis
- Social sustainability and gender equality
- Public Participation
- DRR
- Ecological sustainability

Practical Work:
- Revision of vision and objectives
- Institutional analysis and development
- GIS mapping
- VR-space analysis
- Social sustainability analysis
- Urban systems analysis
- Walk through evaluations
- Integrated projects and policies

TRAINING SESSION 3
Study trip to Sweden
31 August - 8 September 2018

Study visits in Stockholm and Umeå:
Public space, Sustainable mobility, Urban Design, Social integration, Youth activity center, Town District redevelopment, Eco-town, Blue –green strategy, Flood management and DRR, Storm-water management, Bicycle strategy, Girls development of public space, Public participation, Political leadership and strategic planning, Swedish Municipal Planning, Local democracy, Public housing, Waste management, Renewable energy.

Practical Work:
- Development solutions (national, state/regional, local level)
- Strategy for implementation
- Stakeholder analysis Kalay Market
- Inclusive proposal for Kalay Market
- Development scenarios thematic areas
- Development proposal thematic areas
- Sustainability impact assessment

TRAINING SESSION 4
Closing ceremony
4-7 February 2019

Theory:
- Flood prevention in Kalay
- Poverty and social inclusion
- Impact assessments
- Economic sustainability and financial options

Practical Work:
- Socio-economic analysis
- Revision development proposals thematic
- Project matrix
- Impact assessment
- Integrated solutions for urban systems
- Implementation and maintenance strategy
- Financing options

Core team: Change management/deeper studies/use of tools and methodologies

Figure 3: Multi-stakeholder collaboration has been a key throughout the programme.

Figure 4: A joint workshop composed of the high level delegation and the core group of participants from Kalay was conducted during the study trip to Sweden.

Figure 5: Walk through evaluation is one method for more inclusive and participatory urban development processes conducted in Kalay.

The following tools have been used in each session:

S1 Toolbox
- Mapping areas of opportunity and challenge
- Local interpretation of sustainability - mindmap
- SWOT- analysis
- Key sustainability challenges and opportunities
- Stakeholder mapping
- Key objectives
- Vision statement
- Scenariomatrix and impact assessment of scenarios
- Future image (map)
- Backcasting

S2 Toolbox
- Links/delinks (actors and steering documents)
- Have/have not-grid analysis (social sustainability and urban systems)
- Walk through evaluation
- Problem tree analysis
- Change diagram (organisation, policy, projects)

S3 Toolbox
- Structured brainstorming
- Solution clusters
- Backcasting
- Stakeholder mapping- vulnerable groups
- Assessing needs, assets, opportunities and risks for stakeholders
- Design scenarios for Kalaymo Market
- Clustering
- Scenariomatrix for thematic proposals and impact evaluation of scenarios
- Future image/development proposal for thematic areas
- Sustainability rose

S4 Toolbox
- Socio-economic mapping
- List of projects and solutions (financial, institutional, physical, organisational)
- Impact checklist
- Integrated solutions for urban systems - mindmap
- Matrix - projects, mandate/ stakeholder
- Hindering forces
- Estimated costs and financial plan
- Integration of SymbioCity in future work

2. UNDERSTANDING KALAY

2.1 Spatial dimensions

International and national connections

Kalay township is located 130 km from the town of Tamu, on the Myanmar side of the border with India. It forms an important link in the planned East-West economic corridor that will connect Tamu with Mongla, on the Myanmar border with China through Kalay, Monywa, Meiktila, Taunggyi, and Techilek. This is one of the four economic corridors planned in Myanmar.

Kalay is located approximately 600 km from Yangon and 300 km from Mawlamyine, the capital of Mon State. It is connected to the rest of Myanmar by road, railway, and air transportation. The airport, built during World War II, is the only major airport serving the region as well as Chin State, with which Kalay township shares a border. Kalay serves as an important entry point to the remote Chin hills. Kalay is located on the eastern bank of the Kalay River and is separated from the Andaman Sea by a hill range. Its favourable location and connectivity have also made Kalay a burgeoning tourist destination.

Figure 6: Aerial map of Kalay valley.

Kalay Township

Kalay is a township located in the North Western Region of Sagaing in Myanmar. It has a population of approximately 350,00 people and is located on the alluvial fan of the Myittha river. Kalay township has an urban population of 37.4 percent and covers an area of approximately 2,337 sq. km. Because Kalay is the last major town on the route to the border with India, it becomes a major trading centre for goods that are transported from across the border.

Covering an area of 2,337 sq. km, Kalay township is administered as 41 village tracts, and 19 wards, reflecting the predominantly rural population of the township. Since the town is located at the foot of the Chin hills, on an alluvial fan, it has led to a high degree of sedimentation in the town's western parts and poses a continuous threat of flooding and landslides. Furthermore, the town is built on the banks of the Myittha river, running South to North, which meets the Chindwin river system at Kalewa. Kalay's unique geographical location, resembling a fishbowl with hills surrounding the town and large river systems running through the township, makes it vulnerable to hazards. The township experienced widespread flooding and landslides in 2015 (more below), partly as a result of the town's geography and hydrology.

Figure 7: Aerial map of Kalay.

2.2 Institutional dimensions

Township level

The 2008 constitution established agencies to administer the urban wards in a township- called Development Affairs Organisations (DAOs), these agencies represent the only genuinely decentralised layer of governance in Myanmar[1]. DAOs report directly to the State/Regional Governments and significantly, are almost entirely self-funded through own revenue sources. DAOs enjoy a wide mandate to cover urban planning, urban services including water supply, street lighting, and solid waste management, and disaster management, among other responsibilities. Furthermore, they oversee local economic development through the grant of business licences, operation and licensing of slaughterhouses and markets, apart from collecting taxes, fees, and fines.

While DAOs administer the urban wards of the township, village tracts, characterised by low density of population and agricultural land use, are administered by the Department of Rural Development. The General Administration Department (GAD), within the Ministry of the Office of the Union Government, forms the backbone of administration in Myanmar's townships. From administrators at the ward and village tract level to officers at the Union level, GAD's responsibilities range from tax collection to administration of land management to myriad registration and certification processes[2].

While examining the working of the government at the municipal level, it is important to differentiate between municipal bodies that have their own sources of funding and government departments that are dependent on the state/regional, or union levels for funding. An example of the former would be the Development Affairs Organisations (DAOs) who have substantial powers to collect taxes and user charges from citizens. The Kalay DAO functions with relative autonomy and is free to make budgetary decisions regarding their annual expenditure. They report to the Ministry of Development Affairs at the state/regional level and function almost entirely out of the purview of the central or federal government. On the other hand, departments that report to respective line ministries both at the union and the state level are much more dependent on upper tiers both financially and administratively. These set of institutions are examined below.

---

[1] *https://asiafoundation.org/publication/state-and-region-governments-in-myanmar-new-edition-2018/*

[1] *Ibid*

A key policy document for the planning and administration of the town is the Town Plan, prepared usually by the Ministry of Construction. The process of creating a town plan can be divided into two significant components. One, the various departments at the municipal level in charge of functions such as land use, road construction, highways, or water supply create an annual plan that consists of both a list of projects that the department aims to undertake along with a proposed budgetary expenditure. The list of projects could include both new projects proposed at the township level and continuing projects from previous years. In other words, each contingent activity at the municipal level entails the creation of its own plan. These plans are then sent along the relevant line ministry to the state/regional level where a decision is taken on its approval, modification, and financing. Once this draft budget has been approved by the relevant line ministry, it is sent to the state parliaments for approval. If approved at the State/Region, the proposals are then forwarded to the relevant line ministry at the Union level. The same process as in the state/region level is repeated before the draft plan and budget is sent to the Union Parliament for final approval. Plans, thus approved, are then overseen by the state/regional government.

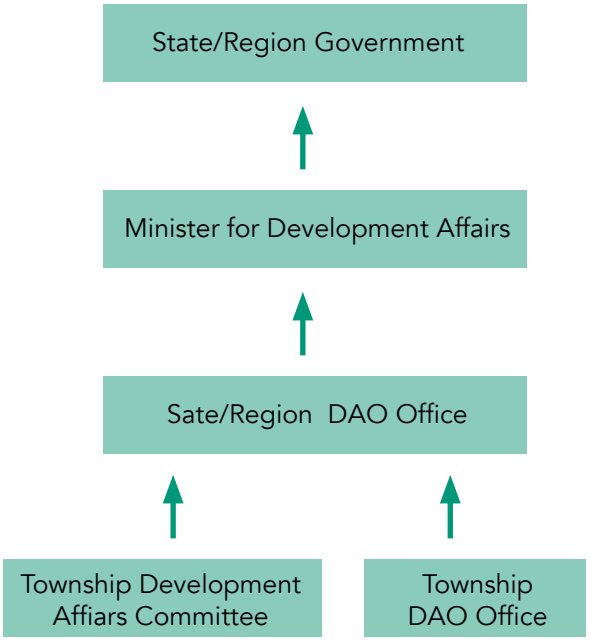

Figure 8: Institutions and planning process of Myanmar.

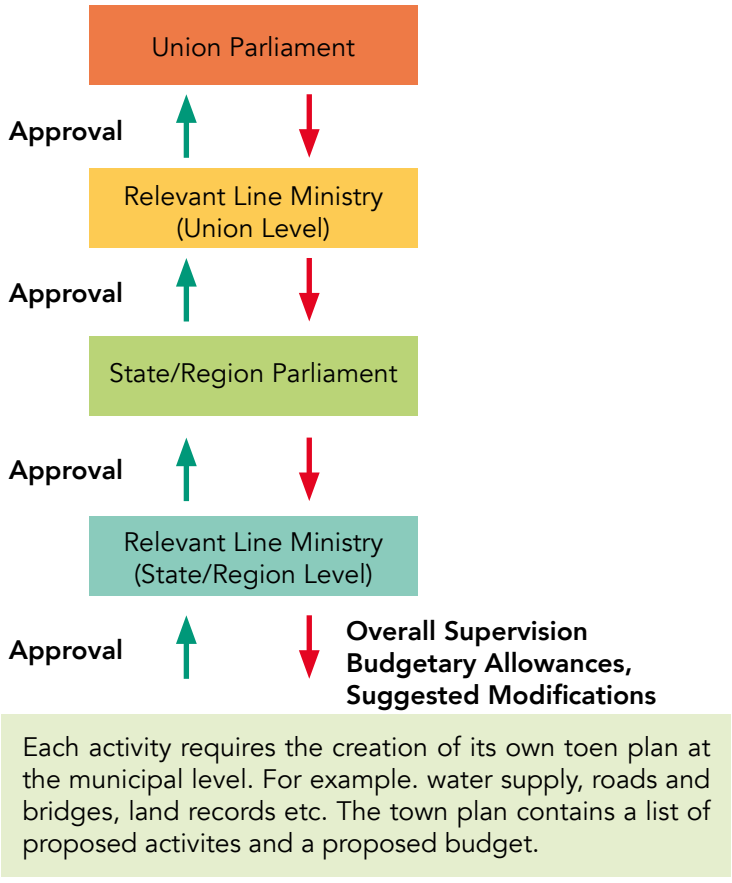

Figure 9: Institutions and planning process of Myanmar.

The second process involves the creation of a more comprehensive town plan that brings together aspects under the jurisdiction of different line ministries/departments including land records, economic activity, planning and budget, and other infrastructure services. For the town of Kalay, this process is currently headed by the Ministry of Construction at the union level. A request to make a comprehensive town plan can begin from either the state/region or union level. The role of the township officials in the making of this process seems to be confined to providing assistance to the union officials and/or providing data and statistics. A draft plan, such as the one for Kalay, may cover several dimensions of urban planning including transportation, economic activity, population, immigration, construction, and involves consultations with several stakeholders at line ministries at both state/regional and union levels. In other words, it combines several aspects of the individual line ministry plans described earlier. The draft comprehensive plan needs to be approved by the Ministry of Construction at the union level before it is sent to the Union Parliament for a final stamp of approval.

2.3 Socio-cultural dimensions of Kalay

Education

Literacy rates in Kalay Township remains quite high, 95.2 percent of students aged 15 and above are classified as literate. This compares favourably to both the average for Sagaing Region and the all-Myanmar average, which is 93.7 percent and 89.5 percent respectively. As the figure above shows, among the population of Kalay, approximately a quarter of the population has attended up to Grade 5 of primary school. Approximately 11.5 percent of the population has high school as their highest educational level. However, education beyond the primary level particularly rates of secondary and tertiary educational attainment remain low with only 8.5 percent of the population above 25 years having attended a university or college. Kalay has three higher educational institutions in close proximity including the Computer University of Kalay, Kalay Technological University, and the McNeilus Marantha Christian College. Not all the children have opportunities to complete their education due to reasons such as inadequate amount of schools.

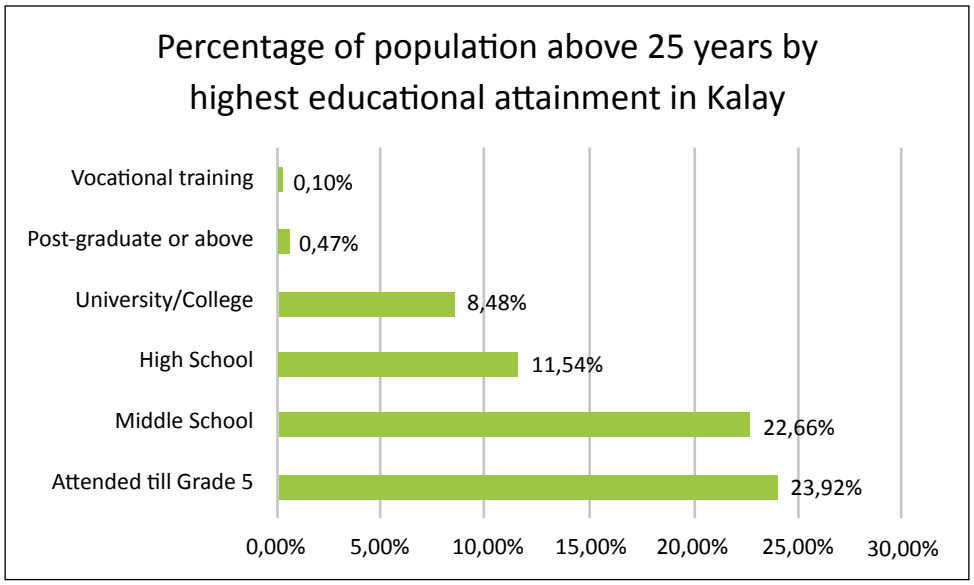

Figure 10: Educational attainment in Kalay

Health

Life expectancy at birth in the Sagaing Region is 65.8 years which is higher than the national average of 64.7 years. The infant mortality rate for Kalay Township is 51 deaths per 1000 live births which is lower than both the regional (60 deaths per 1000 live births) and national averages (62 deaths per 1000 live births). This trend is seen to hold in the under 5 mortality rate which is 71 deaths per 1000 births for Kalay Township. Creating a healthy town with improved healthcare outcomes remains a priority for the town and Kalay is well-poised to benefit from the advantages of a public health approach to urban planning. The core team highlighted the need for improving the town's social infrastructure including hospitals and clinics. Health care facilities are largely needed together with the infrastructure construction to make health care service accessible for everyone.

Gender

Overall, Kalay Township retains a positive sex ratio of 93 males per 100 females. The literacy rate for youth aged 15-24 in the township does not show any significant variation by gender, with the rates at 98.5 per cent for females and 98.4 percent for males. However, while 4.8 per cent of males aged 25 and above have never attended school, the same measure for females is substantially higher at 10.3 per cent. Labour force participation rate of females is 45.9 percent and is much lower than that of their male counterparts which is 82.7 per cent. Furthermore, the unemployment rate for young females aged 15-24 is 7.6 percent (compared to 6.4 percent for males). Data indicates that a majority of the women in the labour force are employed in agriculture, forestry, and fishing (32.6 per cent), while services and sales work employ 18 per cent of the female work force, compared to only 6.7 percent of the male workforce.

[5] *https://www.undp.org/content/dam/myanmar/docs/FA1MMRPovertyProfile_Eng.pdf*

One of the key consequences of gender discrimination in the town is the differential access to public space for men and women. During the field studies of the programme the lack of playgrounds and sports facilities for women and young girls in Kalay was noted. The case of a private skating club, one of the few spaces frequented by young girls for sports, is instructive. The skating rink was located away from the main road and in the shade of trees, enabling the girls to practice the sport with a great deal of privacy. In interviews users of the skating rink pointed to the lack of privacy and accessibility and the excessive visibility of the other public spaces in the town. There is large demand to create more playgrounds, parks, and green areas in the town to serve as public spaces with equitable access.
The core team in Kalay consulted with Kalay Technological University and Kalay University to discuss the gender landscape in Kalay. A workshop with 25 young women who are staff and students of the university yielded interesting results on how to integrate women's perspective into in Kalay's urban planning fabric. The group jointly identified and mapped places where women felt safe and unsafe.

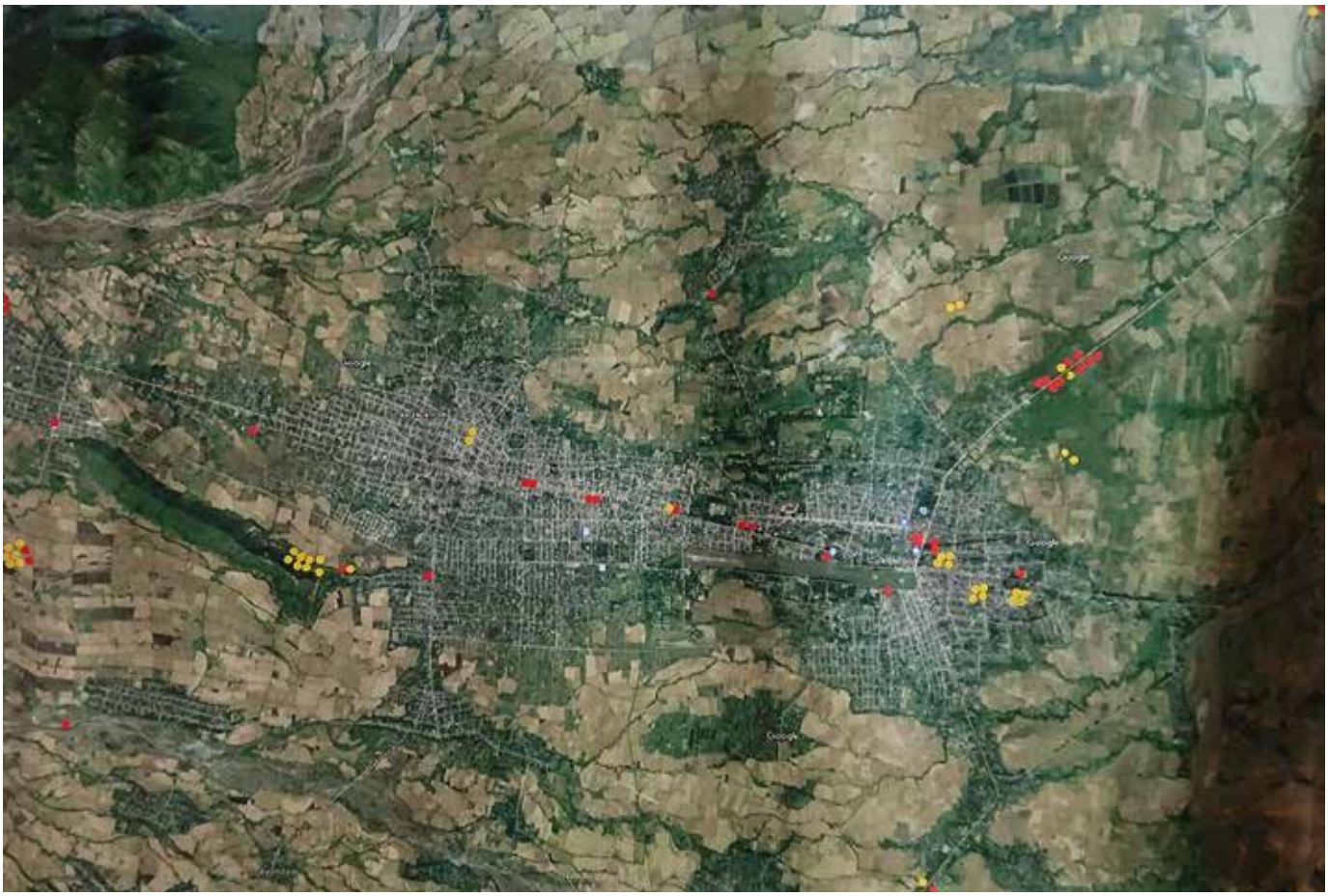

Figure 11: Safety mapping in Kalay, red-unsafe, yellow- preferred places.

The red areas mark the areas of the town that are perceived to be unsafe while the yellow dots mark the areas that are preferred places. The perception of safety in Kalay was signified by the presence of adequate street light at night, the presence of public spaces in the town, and the presence of beer stations or pubs which contributed to a negative perception of safety.

Public space

The lack of public space, parks, and playgrounds in the city was highlighted by the core team and there is an expressed need for increased public spaces in Kalay with equitable access.

[6] *UNHCR. Tanintharyi Region Profile. June 2014. Available at: http://data.unhcr.org/thailand/download.php?id=221*

2.4 Economic dimensions of Kalay

Industrial development

Agriculture and allied activities remain the mainstay of economic activity for Kalay Township. With a large rural population within the township, agriculture makes up for the largest percentage (51.5 percent) of employment by industry in the township. The other top industries, by employment, are wholesale and retail trade (owing to Kalay's favourable geographical location near the Myanmar border with India), manufacturing (primarily at the Kalay Industrial Zone, a large-scale economic zone where medium-scale industries are located), construction activity, hotels, food and transportation. Kalay aims to be a major goods, trade and logistics hub for North Western Myanmar. Kalay's potential as an economic hub of the region today remains untapped.

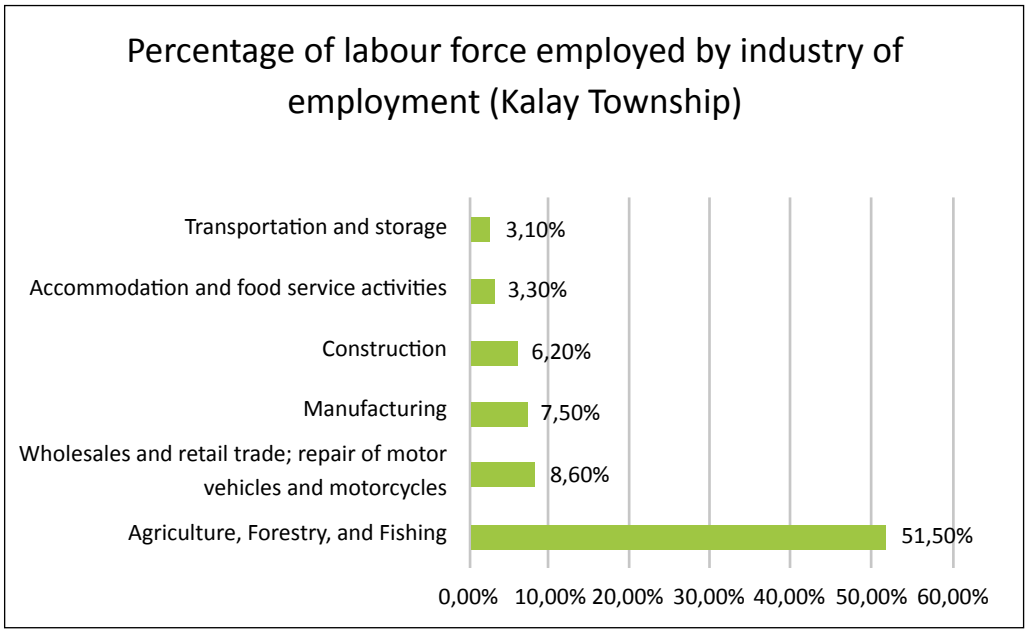

Figure 12: Percentage of labour force by industry of employment.

Example	Profile of Do Bumar Setmu Letmu San Paya village
Location	5 miles from Kalay town
Number of Households	1167 of households (Male population: 1989 and Female population: 2148)
Total population	4137
Economy	Primarily agricultural. Rice and beans are the major crops grown
Access to markets	Produce is sold in Tamu, Monewya, and Mandalay. The village is connected by railway and highway road.
Linkage with Kalay Town	The village has 7 rice hulling factories. It is found that exporting rice to other regions brings economic benefit for the village. Kalay Technology University is near the village area and provides business opportunities like renting apartment for students and selling food and other necessities to students and university employees.
Disaster Risk	The Zea stream flows through the village and the stream caused damage during the floods of 2015. However, floods have remained a common monsoonal occurrence for the village.

Poverty

Sagaing Region has the third highest number of poor inhabitants in Myanmar, after Ayeyarwady Region and Shan state. The high incidence of poverty rate is linked to the situation in the Hill and Mountain zone of the country, which shows the challenges of remote and mountainous terrain. However, the GDP per capita is the third highest in the country, after Yangon and Tanintharyi. The poverty gap is reaching the level of 6,4 compared to the union average of 5,2 (2,3 in urban areas)[3].

Town officials in Kalay created a socio-economic map showing the differences in income (degrees of wealth and/or poverty). The mapping aim influence location of development projects to prioritise areas and communities that are identified to be in poverty. Poor communities were identified to mainly live along the Myittha river and in the outskirts of the city, both in the southern and northern parts.

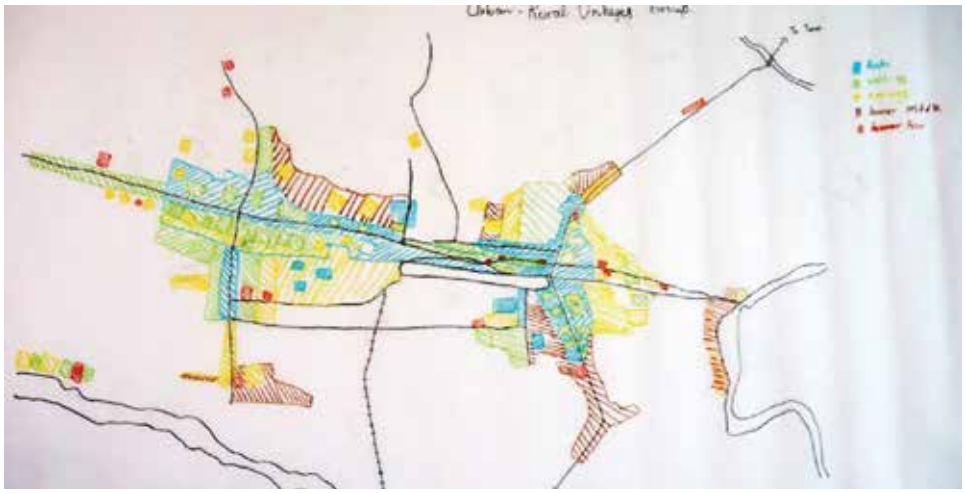

Figure 13: Socio-economic map developed by the core team. Poor areas in red and wealthy areas in blue colour.

2.5 Environmental dimensions of Kalay

Flooding and landslides

Kalay's location on the river causes regular tidal flooding of its bank, especially during the monsoon season, with over 5,000 people being affected and the Myittha River exceeding the hazardous mark of 10 metres. Large-scale destruction of property and agricultural land is annually reported. Kalay is located on an old alluvial fan and sediment deposition/erosion plays a major role in shaping the rivers and streams. That means that floods are influenced and damage reinforced by the sediment deposition/erosion as the river bed is shallow. Extensive deforestation in the Chin Hills also increases the soil erosion and number of landslides in the area as well as increases the impact of natural disasters. In addition, poor urban planning within the town of Kalay including rampant building on the flood plain of the river, reduced surface runoff as a result of road and building activity, an ineffective drainage system, and a disregard for environmental factors in planning served to increase the problem of flooding in Kalay.

Figure 14: The location of Kalay in the Chin Hills.

[3] *https://www.undp.org/content/dam/myanmar/docs/Publications/PovRedu/undp-mm-mlcs-poverty-report.pdf*

There are several existing challenges when it comes to the integration of disaster risk reduction into urban development processes and land use management:

- Information on disaster risk and flood hazard maps are not available in the appropriate formats or scale needed for detailed planning
- Uncertainties surrounding hazards make it difficult to factor them in planning processes
- Financial implications of the measures being proposed as part of land use management to reduce disaster risk
- Political acceptability of the proposed measures, such as restricting development, is limited
- Lack of Interregional and transnational cooperation

Kalay suffered from its worst bout of flooding and landslides in 2015. The immediate cause of the floods and landslides of 2015 was ostensibly the onset of Cyclone Komen in the Bay of Bengal region leading to higher than usual rainfall in Kalay and the surrounding Chin Hills. The Chin Hills which border Kalay on one side received over 10 inches of rain in a day, leading to flash floods, landslides, and heavy outpouring of rain water from the hills to Kalay, which is located at the valley of Chin Hills. This is deemed to be the primary cause of flooding and landslides in Kalay in 2015. The riverbed which rose up by between 6-10 feet in several areas of Kalay, submerged houses and caused widespread destruction. A large part of Kalay's downtown area including the city's main market, general hospital, and other critical infrastructure services were badly affected by the flooding. Landslides with a lot of debris from the ongoing construction work of roads in Chin state was brought down to Kalay. This is also suggested as one of the reasons behind the sudden increase in the rise of river levels.

Flood risk assessment

In the absence of data on the specific hazards and risks facing Kalay, the core team developed a risk-map and elevation profile of the town. The analysis showed that the area with highest risk is in the northern and eastern part of Kalay, whereas the area with lowest risk is the airport runway. The map below identifies potential hazards in Kalay and identifies specific areas based on their risk profile:

- Red - high risk areas and sites
- Light green - medium risk areas and sites
- Yellow - no to low risk areas and sites

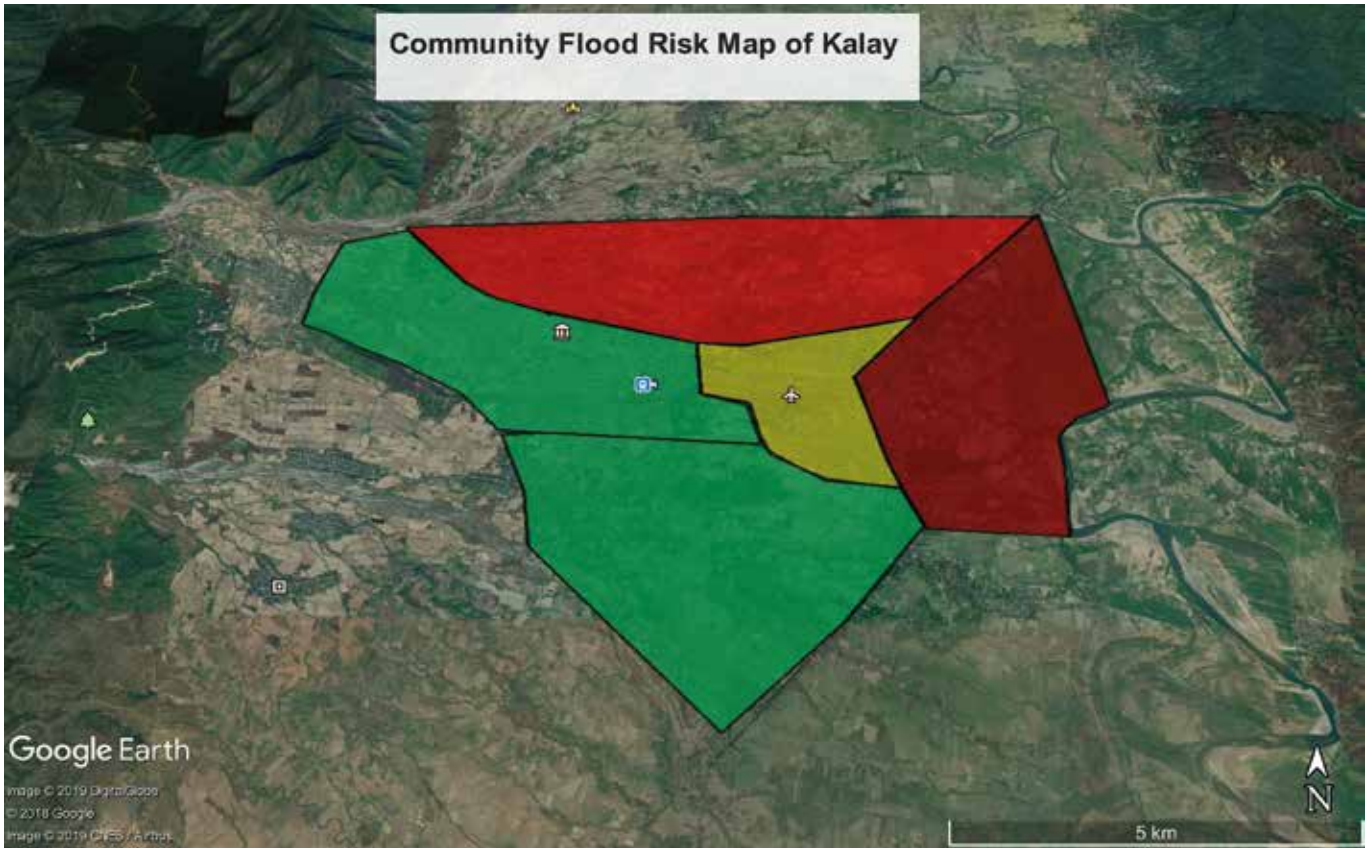

Figure 15: Flood risk assessment map

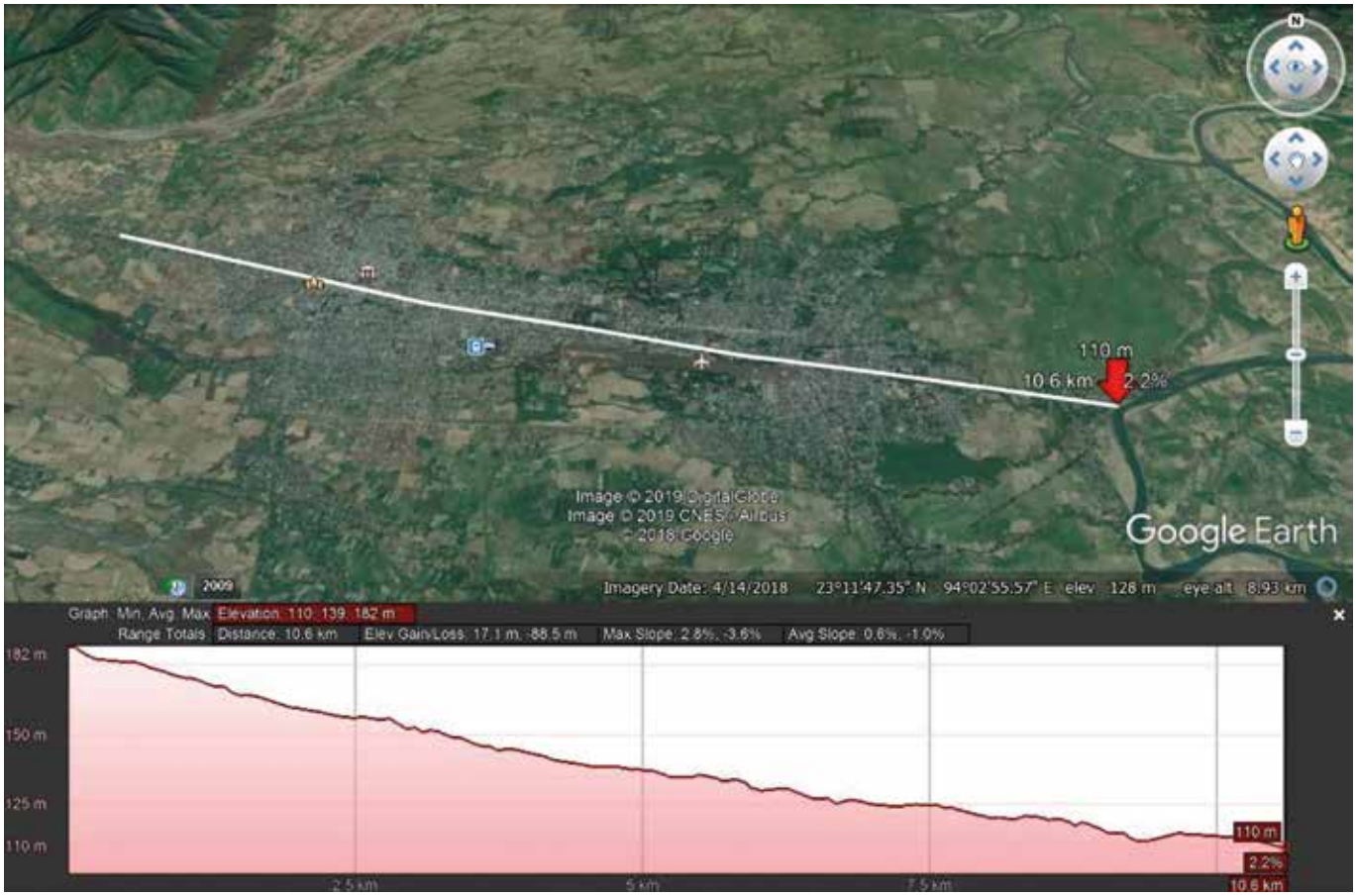

Figure 16: Elevation profile of Kalay, showing the large drop in land level of 70 meters, 2,2%, towards the Myittha river.

An analysis of the permeability of the surfaces in Kalay was conducted, with the support of experts from Kalay university. This aimed to guide future decisions and solutions for flood mitigation and drainage. The locations of the tests are depicted on the map and the results from the tests are presented in the table below:

Figure 17: Location for soil absorbency tests.

Location	Absorbency Rate
Zay Yar Thuka Monastery	1.4 inches per hour
Kalay Public Park	2.4 inches per hour
Shwe Kyaung Daw Monastery	1.4 inches per hour
GAD Kalay Office	0.8 inches per hour
Shwe Yadanar Garden Monastery	8 inches per hour
Kalay University	16 inches per hour

In addition, wards in Kalay that are most and least prone to flooding were identified.

Most flooded wards	Least flooded wards
• Nyaung Pin Thar Ward • Aung Myay Man Ward • Aung Mingalar Ward • Myo Thar Ward • Mingalar Garden Ward • Chan Myae Aung Si Ward • Aung Thit Sar Ward • Taung Au, Pyin Thar, Paung Ku, Tha Phan Eye, Sal Taw Oo, Kan Pearl, So Mar, Yay Lal Oo, Paunk Kon, Thar Si, Inn Sein, Kyee Kone village	• Pyin Lon Ward • Tap Oo Thidar Ward • Aung Zayyar Ward • Myo Hla Ward • Thazin Ward • Sam Myo Ward • Taung Philar Ward • Taung Zalat Ward • Hlaing Thar Yar Ward • Kyo Thone Pin Ward • Inn Die Kone Ward • Tar Yan Ward

Transportation

Today, there is no formal public transport system in Kalay except from informal tuk-tuks and bike taxis. The lack of road safety and lack of pedestrian pathways in the town as well as crossing points at intersections were cited as the major reasons for the lack of road safety in Kalay.

A traffic analysis was conducted, counting of the number of pedestrians, bicyclists, motorbikes, cars, commercial vehicles etc. that pass through specific points in Kalay The data collected was analysed and used to guide proposals for redesigning of street sections at the selected points.

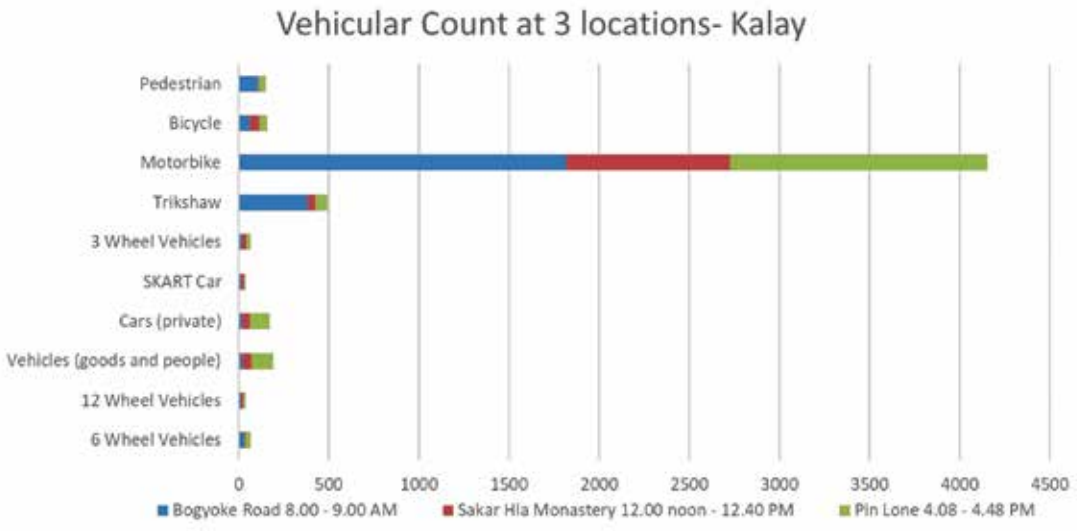

Figure 18: Traffic analysis, 3 locations in Kalay

Water provision and drainage

Inadequate water supply in the main market was identified by the core team as a big challenge in Kalay. This raised issues of public health and sanitation in the market area both for vendors and the customers. In addition, poor connectivity to piped water increased ground water extraction which, if unchecked, could lead to depletion of scarce water resources. In conjunction with a lack of adequate piped water supply, newly developed in Kalay are likely to face water scarcity during some months of the year.

There is a pressing need for upgrading and improving the drainage system as a necessary part of the city's long term response to flooding. Existing drainage are either too shallow to take the flow of the monsoon waters or rendered ineffective by the accumulation of solid waste.

Waste Management

There is a lack of solid waste disposal systems in Kalay, particularly in the interior lanes and roads. The problem is particularly acute near the town's market areas, especially in downtown Kalay and the market in the Tarhan ward. In addition, several of the creeks and streams that run into the main river systems of the town are clogged with solid waste, inhibiting the flow of water exacerbating the risk of flooding and have a negative impact on the water quality.

Environment and Urban Greening

While Kalay has a large amount of green cover, the green cover is concentrated in a few areas. In addition, most of the trees in the city remain in private, fenced off property. The lack of public trees remained one of the most persistent observations by the core team. The main road of Bogyoke Road is a great asset in the city with tall, verdant trees providing shade, shelter and biodiversity.

Figure 19: Landslides are frequent along the Myittha river severely affecting both housing and livelihood of communities.

Figure 20: The trees planted along Bogyoke Road are a huge asset in the city of Kalay.

3. SUSTAINABILITY ANALYSIS OF KALAY

3.1 Key sustainability issues

Key sustainability issues were defined by the participants in the SymbioCity training, describing what sustainability means in the local context of Kalay. This description is defined in accordance to the three core aspects of sustainable development: Socio-cultural, Economic and Environmental sustainability.

- **SOCIO-CULTURAL SUSTAINABILITY**
  Health care, cultural heritage, public participation, equality, social infrastructure and facilities, road safety, education, governance.

- **ECONOMIC SUSTAINABILITY**
  Transportation and road capacity, agricultural development, job opportunities, Small-medium enterprises, tourism development.

- **ENVIRONMENTAL SUSTAINABILITY**
  Natural preservation and ecosystems, renewable energy, drainage system and waste management, natural disaster risk prevention.

3.2 Key challenges and assets

To share the view and development for the future, challenges and assets were identified. Specific analysis has been done on social inclusion, as well as public space and landscaping.

Overall Key Challenges	Overall Key Assets
• Floods and landslides • Deforestation • Traffic situation and congestion • Airport central location negatively affects health, traffic and living environment • Market areas are not upgraded and lack space • Waste management • Litter in waterbodies and public spaces • Shortage of labour as young people go abroad for work • Drug addiction among young population	• Fertile land and flat terrain give good possibilities for agriculture which is the main economic sector • Beautiful sceneries of mountains, forests, rivers and creeks • Rich in natural and mineral resources • The airport of Kalay • Large trade possibilities as close to the Indian border and Chin State • Different modes of transport such as road, rail, air, and water are available for goods and products • Tourism potential • Different religions and groups live together • Higher education is accessible in Kalay with high schools, technical institutes and universities like Kalay University, Computer University, etc.

Figure 21: Opportunities (white) and challenges (red) on regional scale and in Kalay town. Specific areas of opportunity included the city's commercial areas including the markets, residential areas unaffected by floods and the city's educational institutions particularly the universities. Areas of challenge mostly included flood affected locations such as the river banks of Myittha river, due to flooding and landslides. The airport was marked both as an opportunity and a challenge, as it could provide economic value of the town. On the other hand, to shift the airport out of the central part of Kalay would free up space, reduce traffic congestion and noise pollution.

Social inclusion

Problems
- Discrimination according to culture, traditions, appearances and wealth
- Inheritance only by boys
- Sexism
- Gender discrimination in working environment and within family
- Most of the sports ground are used by men
- Inequality between men and women in university entrance examinations
- No equal opportunity for promotion, wages and job opportunities
- Domestic violence
- Drug abuse

Assets
- House for elders
- Recreation centre
- Community centre
- CSOs for women
- Orphanage
- Labour leave
- Education for women
- Participation of women in social groups
- Freedom in religious belief
- Underage rape law

Avoid
- Discrimination towards workers and house servants
- Bars and night clubs
- Sexual harassment to women

To strive for
- Fitness centres, playgrounds and recreation centres for women
- Male nurses in public hospitals
- Equal relationship in family
- Equal responsibilities for children
- Rule of law and young rape law
- Safe playgrounds
- Female sport teams
- Equal salaries
- Male teachers
- Safe environment for women in public space
- Equal job opportunities

Landscape and public space

Problems	**Assets**	**Avoid**
• Preparations and preventions for floods which influences transportation quite much in rain season • More main roads crossing through the town • Lack of green space in newly developed neighbourhoods • Sewage from factories	• Parks • Theatre • Golf Club • Playgrounds • Trees along the roads • Slums • Dirty places • Child worker • Viewpoint • Football playground	N/A

To strive for

- Walking and relaxing space for children
- Recreation centre for different age groups
- Upgrade the U-bok creek area into a recreation area
- Clean water
- Improved walkability and public transportation
- Biodiversity and ecosystems
- Larger number of accessible public space for everyone including playground, viewpoints, recreation centre etc.

Problem, Cause and Effect

To gain a better understanding of the negative synergies of the existing situation some specific challenges were further analysed for proposing improvements.

Problems	**Cause**	**Effect**
Natural Disasters	• Deforestation • New infrastructure projects lead to decrease in forests • Climate change • Not enough budget for proactive management • Lack of coordination on regional and transnational level	• Land slides • Economic impact for affected communities living along the river • Creeks and rivers disappear or change route • Loss of water resources • Lack of clean drinking water
Pollution of U-bok creek	• Large amount of trash in the creek • Black water (sewage) going directly into the creek • Illegal fishing • Dead animal bodies being thrown into the creek • No maintenance	• Bad water flow causing floods • Mosquitoes • Negative health effects • Decreasing amount of fish • Can't use water from creek • Can't use as recreation area • Degradation of biodiversity
Poor road Safety	• Drivers do not respect traffic rules • High speeds • Alcohol consumption • Lack of parking space • Lack of traffic lights • Poor visibility in crossings • Poorly designed road • Lack of lanes for pedestrians • Large number of motorbikes • Lack of maintenance	• Human causalities • Damage vehicles • Traffic congestion • Limited transportation possibilities • Lack of accessibility for different groups

Problems	Cause	Effect
Poor transportation network	• Roads and highways are in poor condition • Mountainous landscape • High costs when using air transport • Bad weather (landslides during raining season) • Roads between Kalay and other towns/cities cannot be used all year around and separates Kalay from other places	• Traffic congestion as trucks need to enter the town • Bad air quality • Long hours of traveling • High cost of living • Slow economic development • Many accidents • Difficult to transport during raining season
Low income from agricultural sector	• Lack of modern techniques • Instable weather • Lack of proper drainage system • Poor transportation network in rural areas • Weak law enforcement for protecting local farmers • Lack of agricultural education	• Non profitable business • Low living standards • Lack of access to education • Not enough nutrition • Health problems • Depression
Insufficient space inside Myoma Market	• Large number of costumers • Lack of upgradation • Narrow lanes and low ceilings	• More shops are opened unregularly outside the market • Bad ventilation inside the market area • Not healthy environment
No trading zones	• No regional economic policy • Poor road transportation • Small amount of local products • Few local traders • No market for local products or dedicated space for wholesale marketers	• Small profit • Low employment rate • Low income • Slower flow of goods • Low foreign income • No value added products

4. STRATEGY FOR KALAY

4.1 Vision and objectives

TThe vision for a sustainable development of Kalay developed by the multi-sectoral working group:

> "By 2040, Kalay is a trade centre and transport hub which is resilient to disasters by focusing on proper management of natural resources, job opportunities, capacity development and citizens' engagement."

The following objectives are developed as a response to the sustainability challenges identified to fulfil the vision of Kalay 2040.

Objective 1	Sustainable transportation and basic infrastructure are improved and developed for all users, and future developments provide well-built basic infrastructure.
Objective 2	Good balance is achieved between urban and rural development where one part of the urban-rural linkages is the increased delivery of high-quality local products.
Objective 3	Happiness and peacefulness is significant for Kalay with a strong trade economy that have made it the trade centre of North West of Myanmar.
Objective 4	As a green town resilient to natural disasters, natural resources and cultural heritage is utilized and developed in conjunction with the development of human resources.
Objective 5	Kalay citizens are healthy, wealthy with a high level of education and basic social infrastructure is provided.
Objective 6	All urban citizens are included and allowed to participate and collaborate in urban administration and development.

4.2 Prioritised development for Kalay 2040

The overall strategy and proposal for a sustainable development in Kalay is broad in scope and has been considering both physical, financial, organisational and institutional solutions. Overall development strategies are presented in the first part. Within the themes of Sustainable mobility, Social infrastructure, Economy and trade, Urban-rural linkages as well as Green/blue infrastructure and DRR more specific development proposals have been developed.

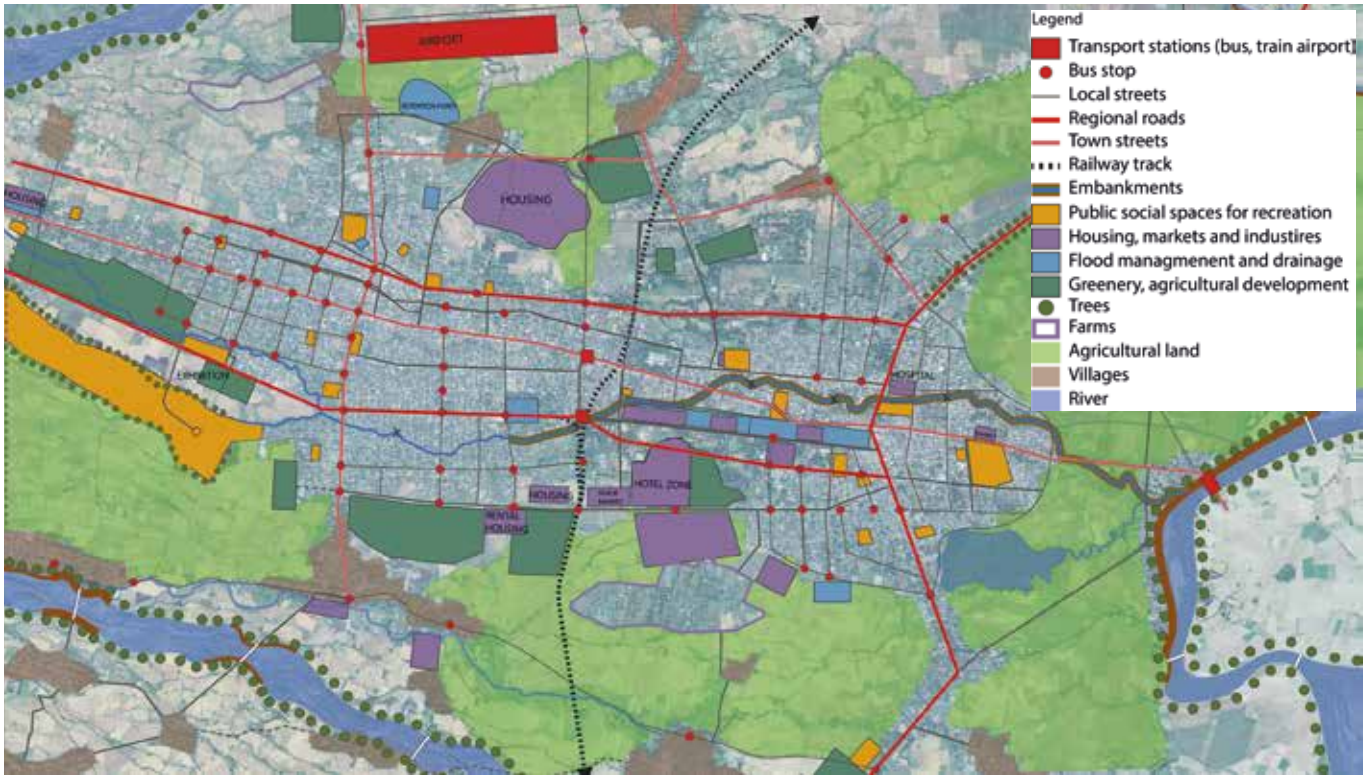

Figure 22: Overall proposal of Kalay 2040

- **Improved and more sustainable traffic situation** including improved safety, public transportation, railway upgrading, non-motorised modes of traffic and improved urban-rural linkages.
- **Airport relocation and upgradation** for improved services, transportation, trade and minimise the negative impact such as air pollution and noise in the central part of the town and its residents.
- **Improve Social infrastructure** with large attention to public space accessible for all including parks, playgrounds, sports, youth centres etc.
- **Development of urban systems** such as energy production, waste-water management and clean water production.
- **Develop market and trade** for current and future market places, trade zones, agricultural development, local economic development and research.
- **Flood management plan** covering local and regional solutions to increase flooding capacity including conservation and restoration plan for greenery.
- **Housing strategy** for flood affected communities that ensures livelihood and affordable housing.
- **Integrated stakeholders' participation** in urban development projects.

5. THEMATIC FOCUS AREAS OF THE STRATEGIC PLAN

The thematic focus areas of the strategic plan contain further developed proposals within: Sustainable mobility, Social infrastructure, Economy and trade, Urban –rural linkages and Green/blue infrastructure and DRR. Specific improvement projects are proposed as well as strategy for implementation to meet the vision of Kalay 2040.

5.1 Sustainable mobility

The proposal builds on the challenges identified and the traffic analysis conducted by the working group. The recommendations are to shift to a public mode of transportation with buses and a clearer organisation of roads including creation of safe spaces for pedestrians to walk and lanes for bicycles.

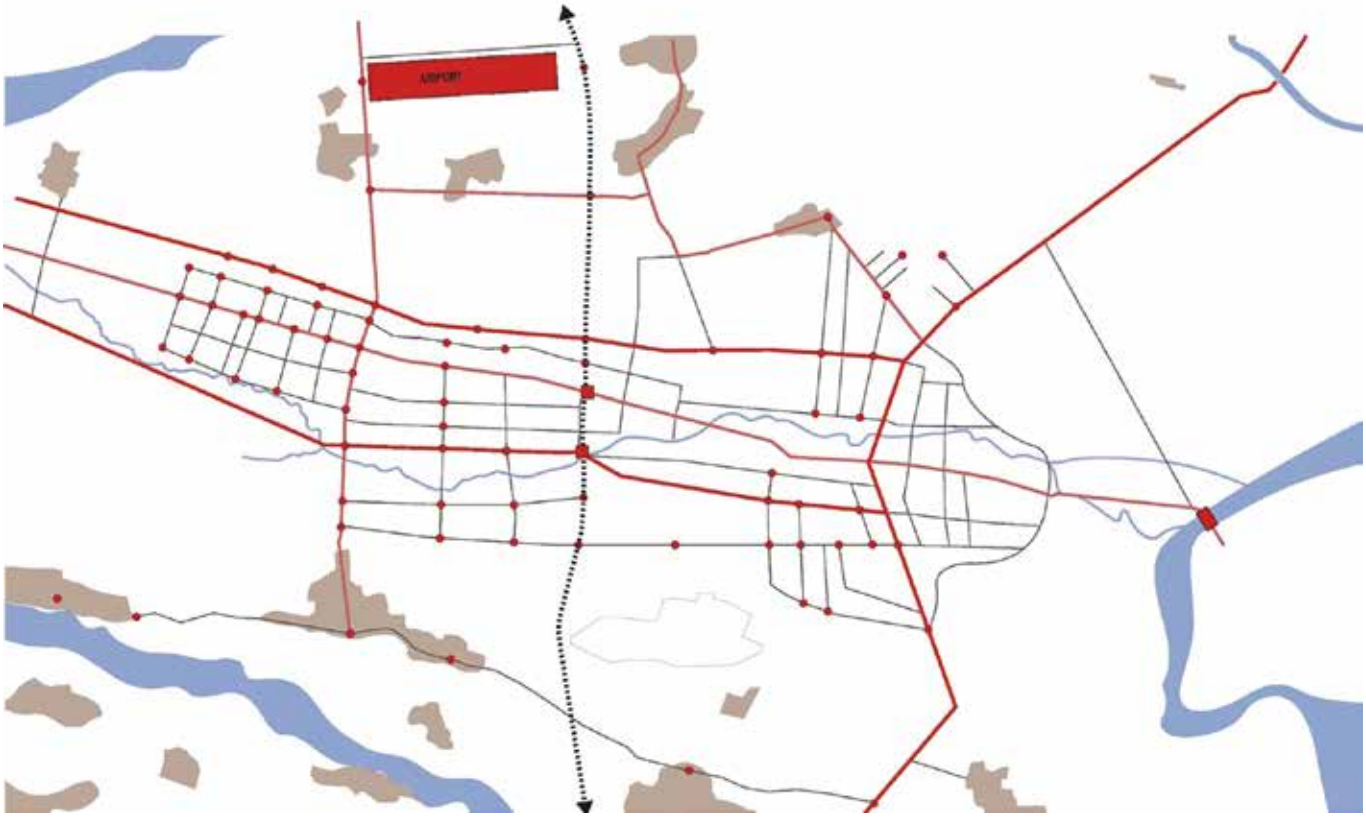

Figure 23:Thematic proposal sustainable mobility

Key aspects of proposal

- Minimize accidents and improve mobility in the town and region through upgrade of the main town road and local streets, improve the regional roads and other transportation means, including airport and railway.
- Minimize air pollution and improve biodiversity and ecosystems through greenery along the streets.
- Enable access to public transportation in Kalay with improved bus network, bus-stops and safe sidewalks.
- Improve safety, accessibility and walkability in Kalay, especially in secondary streets through lightning, bicycle lanes and walkways.
- Create a safer environment for children.
- Improvements that will benefit trading and the role of Kalay as trade city.
- Improve urban-rural linkages through improved connectivity between regional roads, local streets, railways and airport.
- Improve secondary and regional roads as alternative routes to the main road which is now heavily trafficated.
- Introduction of new technology such as electronic bicycles with solar charging system.

Specific sustainability indicators that have been incorporated in the proposal:

- Accessibility to public transport
- Walkability
- Trade accessibility
- Accessibility to urban functions and services
- Social inclusion

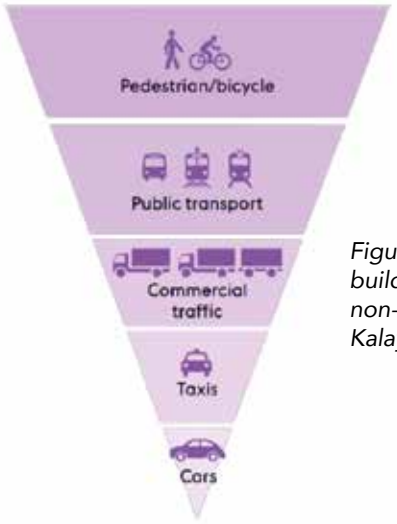

Figure 24: The mobility strategy builds on the logic to prioritise non-motorised transport in Kalay.

Specific improvement projects

Physical solutions

- Upgrade of main street, secondary streets, regional roads, access roads.
- Ramps for wheelchair
- Road signs
- Public transportation
- Bus station
- Bus stops
- Railway
- Zebra crossings
- New airport
- Roads for emergency
- Electric bus to change stations
- Drainage for storm-water management
- Culverts to give ways to proper flow of water
- Bus, motorbike and bike lanes
- Sidewalks and streetlight for pedestrians etc.
- Embankment for railway to avoid flooding
- Modern railway station
- Cargo warehouse, etc

Organizational solutions

- Collaboration among companies, third party, INGOs, planning department, and Ministry of Construction
- Road supervision committee
- Loan supervision committee
- Highway department
- India-Myanmar trade committee
- Road safety campaign
- Traffic police
- Tender committee
- Railway department
- Advisor committee
- Trading & commerce committee
- Tax committee

Financial solutions

- Tax
- Loan
- Donor
- BOT
- Fine
- Local/regional and union budget
- Foreign Investors
- Development Aid
- Natural resources
- Municipal budget Roads (user fee)

Institutional solutions

- Tra□c laws
- Highway law/code
- Trade policies & trade laws
- Policy for land use Railway code/law

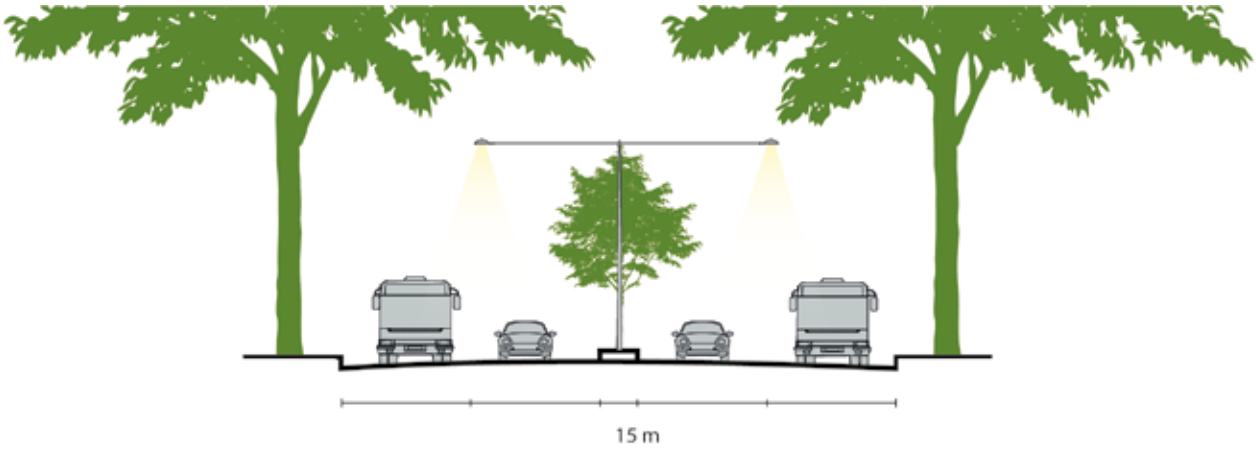

Figure 25: Regional road

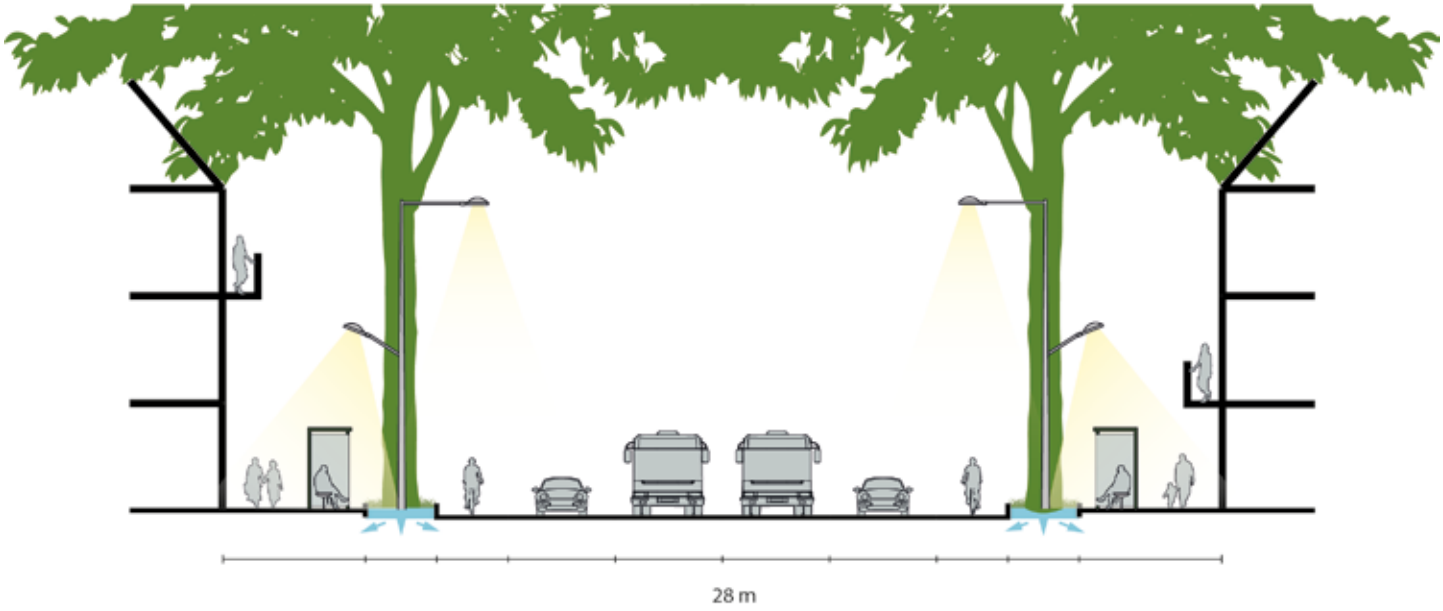

Figure 26: Main Town Street

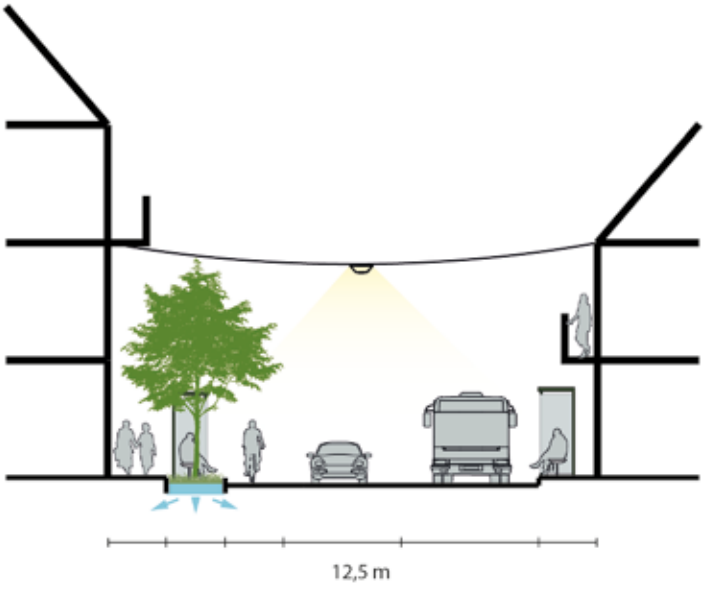

Figure 27: Secondary Town Street

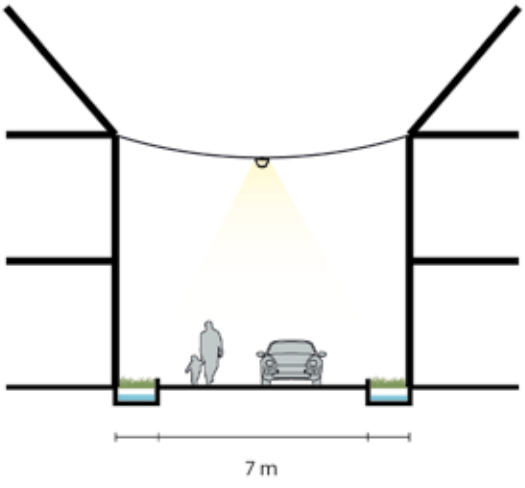

Figure 28: Local Street

Integrated solutions

One of the core ideas of SCA is that the efficiency of integrated solutions can create synergies among urban systems in order to reduce both impacts and costs. All urban systems planning should consider both strategies and integrated solutions based on inter-system synergies, to enhance efficiency, increased sustainability and reduce costs. Example of some specific ideas proposed for more integrated solutions, connecting the different urban systems for sustainable mobility:

- Upgrade regional roads for improved urban-rural linkages, for instance, to add bus stand and road sign, to culvert bridge, and set up traffic control centre (Mobility/traffic and public space)
- Upgrade streets for improved accessibility and good connection to public spaces including zebra crossings, bike lanes, walkways, ramp from wheelchairs (Mobility/ traffic and public space)
- Provide bus stops and stations connected to public spaces and specific nodes in Kalay
- Drainage systems and flower boxes along the streets and greenery along main roads and in public places for improved irrigation (Public space and landscape/ ecosystem)
- Separate trash bins and recycling waste to produce energy (Waste/material, energy and urban function)
- Upgrade of drainage system (Sanitation/water, building and urban function)
- Solar energy in the city, for example on street lights (Energy and urban function)
- Setup and upgrade regional roads (Mobility/traffic and urban function)

Figure 29: Illustration of the way different urban systems are connected in the proposal for sustainable mobility.

Impact assessment

An impact assessment was done to analyse important ways of maximising positive effects of the proposal and minimise negative impacts during implementation.

IMPACT ASSESSMENT OF PROPOSAL – Sustainable mobility

Type of Impact	Target Group	Positive Outcomes	Negative Outcomes	Short/Medium/ Long Term	Measures to max. positive & min negative impacts
Accessibility to Public transport	• Elderly • Children • Women vs men • Disabled	• Cheap transport charges • Low carbon emission	• Potential accidents • Air/sound pollution	Short Term	• One separate lane for public transport • Plan for disabled and elderly
Walkability	• Citizens • Disabled • Children	• Improved health • Improved access to public spaces • Exposure to environment	• Traffic accidents	Short term	• Properly designed streets and crossings • Ramps for wheelchair • Traffic regulations • Penalty for drivers

Trade availability	• Farmers • Businessmen • Customers	• Increased income that generates higher tax revenue	• Cultural effects • Increased drug use • Price will be higher for local products	Shot/medium/ long term	• Strong rules and regulations regarding trade
Improved transportation links between urban and rural areas	• Villagers and famer • Dwellers	• Improved access to urban facilities • Farm products • Job opportunities	• Increased congestion and noise pollution	Short/medium term	• Plant more trees • Provide bus lanes • Electric motor bike
Social inclusion	• Disabled people • Women • Children • Poor community	• Access to services and public spaces • Equal rights • Decreased discrimination		Short/medium term	• Public awareness • Improved social cohesion • Inclusive and collaborative processes

Strategy for implementation

Concrete steps and processes that would enable the realisation of the spatial vision were laid out. Specific core parts of the project were further developed into an implementation and maintenance strategy:

PROJECT			MANDATE/STAKEHOLDER	
THE WHAT	**THE WHEN**	**THE HOW**	**IMPLEMENTATION**	**MAINTENANCE**
Regional Roads/ Main Town Streets/ Secondary Town Street/ Local Street	Short Term Medium Term Long Term	• Toll Gates- for road user fees • Bus Stations-improved road networks • Bus Stops-for public transportation • Road Signs-for road safety • Ramps for persons with wheelchairs • Drainage system-storm-water management • Culverts to give ways to proper flow of water (prevent from erosion of road by flows) • Bridges- flow of water • Lanes for bike-users • Walkway for pedestrians • Traffic control centres • Solar street lights – for improved security • Restaurants for highway users • Parking spaces along main town streets, secondary streets, local streets • Parking spaces for regional buses • Highway security posts • ICT centres for traffic control, traffic management, information giving etc., • Landscaping and tree planting along roads & streets for multipurpose-shadows for pedestrians, drainage, ecosystem services, green environment etc.	• Ministry of Construction • Ministry of Commerce • Member of Parliament • Planning Department • General Administration Department • Ministry of Electricity and Energy • Developers • Companies • Municipality (Local) • Ministry of Transportation • Regional Government • Foreign Investors • BOTs (Build/Operation/ Tax fee) • Tax-payers • Public	• Companies • Ministry of Construction • Planning Departments • Ministry of Electricity and Energy • Municipality (Local) • BOTs • Public

Railway	Long Term	• Embankment for railways-to avoid flooding • Station-modern one that use latest technology • Tickets centre/system-online • Cargo warehouse	• Myanmar Railway • Companies • Developers • Technicians (Domestic/ Foreign) • Tax-payers • Public	• Myanmar Railway • Companies • Traders/Businessmen
Airport	Long Term	• Air terminal building • Landing strip • Facilities such as Hotels and shops • Taxi stands • Bus stands • Travel agencies	• Aviation Department • Ministry of transportation and communication • Planning department • Union government • GAD • Ministry of Tourism Companies/Corporations	• Aviation Department • Technicians • Foreign Investors • Airlines administrators • Companies
Road for urban-rural linkages	Short Term Medium Term	• Bus stands • Road signs • Access roads to villages • Culvert bridge • Traffic control centre	• Village development department • Development of rural road and development • Union government • GAD Ministry of Electricity and Energy	• Village development department • Department of rural road and development • Community • Company

The hindering and helping forces were examined to get a better understanding of how to mitigate the potential forces that might delay project implementation.

Hindering/helping forces for implementation	
Hindering forces:	**Helping forces:**
1) Lack of financial means 2) Land for new airport establishment 3) Existing buildings 4) Raw material 5) Law and policies 6) Technology 7) Ongoing conflicts 8) Lack of public support	1. Public support 2. Regional government approval 3. Geopolitics 4. Financial means 5. Law and policies 6. Technological solutions

5.2 Social infrastructure

The proposal for social infrastructure focuses on 5 aspects more in depth: public space, social cohesion, public health, gender, and safety. The group identified several areas in Kalay that are perceived to be unsafe by women. The group has tried to make these places safer and more accessible through low-cost interventions such as bus-stops, benches, and stores. Most of social infrastructure projects are short and medium-term except for some projects about public parks.

Figure 30: Thematic proposal, social infrastructure

Key aspects of proposal

- Provide accessible public spaces with functions such as playgrounds, public toilets and trash bins.
- Improve safety for women in public areas based on the identified areas perceived as unsafe.
- Construct a new park with diverse functions and accessibility for different groups in Kalay.
- Preserve the Taung Pilar's as an environmental conservation area and improve access.
- Increase possibilities for sport activities for youth for example through trekking routes.
- Provision of public housing.
- Youth centres for youth activities.
- Develop walkability and access to U Poke.
- Increased social topics in high schools such as gender, drug use, ethnic languages.
- Set up of a research centre integrating the three existing universities in Kalay.
- Improved health care and extension of hospital.
- Standardize the education system.
- Community centre included in the Township library.
- Participation in development processes.

Specific sustainability indicators that have been incorporated in the proposal:

- Public space
- Social cohesion
- Health and sustainable lifestyles
- Accessibility to urban services
- Gender equality
- Safety

Specific improvement projects

Physical solutions

- New Hospital for the whole North-western Region associated with Medical Research Centre
- New park development with focus on women's priorities
- Build playgrounds and mini libraries within parks
- Disaster resilient schools
- Set up a community centre
- Upgrade road access to Taung Philar viewpoint
- Connect main roads to public parks
- Trash bins inside parks and around viewpoint
- Set up libraries in universities including E-library
- Create trekking routes
- Develop landscape design along U Poke creek, build wooden bridge and develop waste collection to improve environment and public health
- Public toilets within parks
- Set up Kalay's development research centre collaborating with departments
- Create walkable paths for elderly
- Build places for sport activities for all ages and gender, including indoor stadium for all types of sports
- Stalls for business inside the parks
- Low cost housing & rental housing for low income and vulnerable families
- Student housing for 3 universities
- Basic services in informal settlements

Organization solutions

- Education of youth on gender equality, drugs, sport, ethnic languages, and geography
- Teach English, computer and vocational training in primary education
- Include activities and functions of dance, library, sport activities and gender awareness training in community centre
- Connect communication department and library
- Establish a foundation to provide scholar and student loans
- Information campaign about natural disasters response and crime prevention
- Improve gender balance in different sectors

Financial solutions

- Use taxes and income from the park to sustain its development and maintenance
- Establish foundation to provide scholarship and city fund
- Bank housing loans and capital for make small and medium business
- Health Insurance System

Institutional solutions

- Restrict posters and billboards to not block views, heritage sites or entrances
- Compulsory education system
- Free medical care
- Ban single use of plastics around Taung Philar Hill area to conserve environment

Park proposal

Based on the safety analysis conducted with group of women in Kalay and, a design proposal was developed for a new park in Tartan Ward on land owned by the TDC. A workshop session was conducted with a focus group of women from the University. The design of the park sought to address concerns about safety and security in the city and catered to the needs and demands of women, particularly young women in the city by including public space, libraries and educational spaces, playground, benches, stage, spaces for recreation and sports activities including swimming as well as large open and well-lit areas for walking and relaxing.

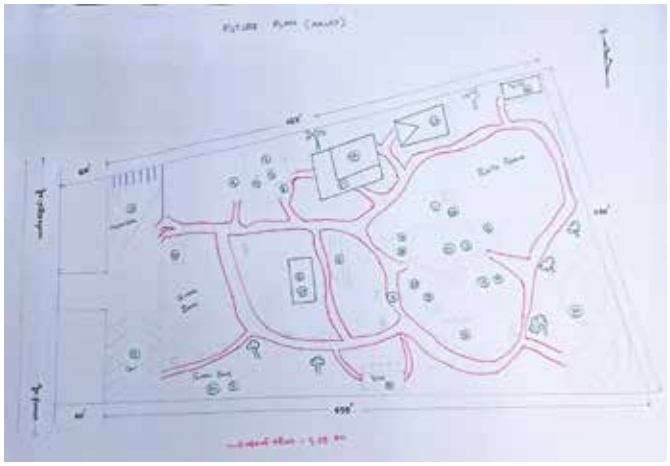

Figure 31: Park proposal

Integrated solutions

Some specific ideas for more integrated solutions, connecting the different urban systems were proposed:

- Taung Philar viewpoint and ecosystem conservation area (landscape/ecosystem, public space and material/waste)
- ICT information in community centre (ICT and building)
- Upgrade public parks with wifi, walkable path for elderly, etc. (Public space, ICT and Mobility/traffic)
- Provide waste collection service along U Poke creek (Waste/material, landscape/ecosystem and public space)
- Upgrading U Poke creek, to build wooden bridge over the creek to connect with main road and connect main road to park (landscape/ecosystem, public space and Mobility/traffic)

Figure 32: Illustration of the way different urban systems are connected in the proposal for social infrastructure.

Impact assessment

An impact assessment was done to analyse important ways of maximising positive effects of the proposal and minimise negative impacts during implementation.

IMPACT ASSESSMENT OF PROPOSAL – Social infrastructure					
Type of Impact	**Target Group**	**Positive Outcomes**	**Negative Outcomes**	**Short/Medium/ Long Term**	**Measures to max. positive & min negative impacts**
Improved public spaces	• Women • Men • Elderly • Children • Disabled	• Improved possibilities for recreation • Connection with people • Improved health	• Need for accessibility	Short Term	• Upgrade various places for accessibility of all groups

Improved social cohesion	• Women • Men • Elderly • Children • Disabled	• Integration between different social classes and genders			• Consider spaces and possibilities for social inclusion in future projects
Healthy and environmentally friendly lifestyle	• Women • Men • Elderly • Children • Disabled	• Improved environment	• Lack of budget and human resources	Medium term	• Promote public participation
Accessibility to urban services	• Women • Men • Elderly • Children • Disabled	• Accessibility for all to public spaces, religious spaces and service			
Gender equality	• Women	• Encourage people to join			
Improved Safety	• Women • Youth	• Safety in public spaces • Possibility to travel anytime			

Strategy for implementation

Specific core parts of the project were further developed into an implementation and maintenance strategy:

PROJECT			MANDATE/STAKEHOLDER	
THE WHAT	**THE WHEN**	**THE HOW**	**IMPLEMENTATION**	**MAINTENANCE**
Health care service	Medium term	• Upgrade existing hospital • Extend special treatment centre • Medical research centre • Free health care service	• Parliament • GAD • Ministry of health and • sport • CSO	• Ministry of health and sport
Taung Philar view point and ecosystem conservation area	Medium/ short term	• Trash bins • Public toilets • Place for exercises • Upgrade roads which is connected to view point • Create trekking route for youth • Classify the areas as an environmental conservation area	• GAD • TDC • Ministry of tourism • Ministry of health and sports • CSO	• TDC • Ministry of health and sports
Public Park	Short/ medium/ Long term	• Create job opportunities • Trash bins • Free Wi-Fi • Public toilets • Mini-library and playground for children • Stage, swing, open spaces	• GAD • Ministry of health and sports • TDC • CSO • Community	• Ministry of health and sports • TDC

		• Walkable path for elderly • Maintenance fee • Upgrade connectivity with main road • Ramps for accessibility of wheelchair • Sport activities • Create a public space in Aung Mingalar ward		
Upgrading of U Poke creek	Short/ medium term	• Construct retaining wall • Build wooden bridge for walkability • Create small path for recreational purpose • Provide waste collection service	• TDC • CSO • GAD • Community • Yay Myit Phyo	• TDC • CSO • Community • Yay Myit Phyo
Setting up Kalay's research centre and standardize education system	Short/ medium term	• Educate youth about gender, drug, sport, ethnic languages, and geography in school • Provide resilient school • Form a foundation to provide scholarship and loans • Establish library and e-library • Collaborate with regional government to do research • Compulsory education system	• Parliament • GAD • Ministry of education • CSO	• Ministry of education
Community Center	Short/ medium term	• Encompass Wi-Fi network to share information about natural disasters and crime prevention • Activities and trainings about gender, drug, sport, ethnic languages, and geography • Connection between communication department and library	• GAD • Communication department • Police	• Communication department • Police

The hindering and helping forces were examined to get a better understanding of how to mitigate the potential forces that might delay project implementation.

Hindering/helping forces for implementation	
Hindering forces:	**Helping forces:**
1) Budget 2) Lack of space for extension of hospital 3) Lack of medical support 4) Awareness 5) Low public attention	1) Existing infrastructure 2) Land available for new park establishment 3) Existing University for capacity building and research 4) CSOs 5) Public interest 6) Compulsory education system 7) Existing ban of littering

5.3 Economy and trade

The proposal for economy and trade further deepens the strategy for Kalay to become a trade centre in 2040, building on existing economic activities but also enable improved logistics and trade possibilities locally and regionally. The proposal focuses on setting up hotel zone and trade zone, upgrading markets and develop low-cost housing that are favourable to the town's development.

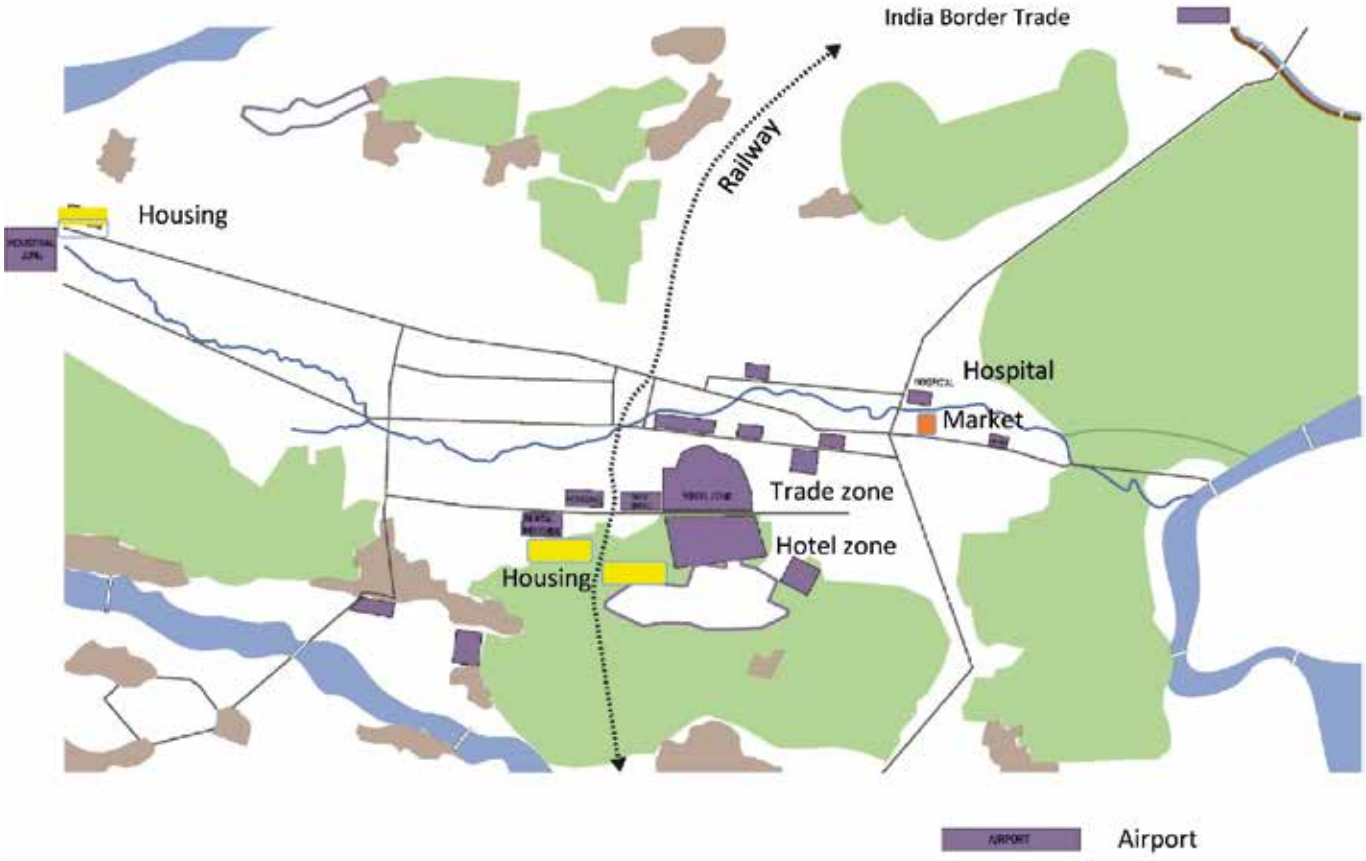

Figure 33: Thematic proposal, economy and trade

Key aspects of proposal

- Trade zone next to the main roads and railway including warehouses and information centre.
- Standard hotel zone to provide accommodation for tourists and businessmen with green spaces, renewable energy.
- Low-cost and rental housing through Private Public Partnership.
- Upgraded markets including waste management, sanitation facilities, parking spaces and a new market establishment with good standard.
- Railway station and improved train routes for connection to other regions and trade possibilities with India.
- Increased job opportunities and poverty decrease.
- Myo Ma market developed into a standard market area.
- Strong collaboration among different stakeholders, business groups, departments and policy makers to achieve 2040 Kalay's vision.

Specific sustainability indicators that have been incorporated in the proposal:

- Local economic development
- Poverty reduction
- Long term balanced budget

Specific improvement projects

Physical solutions

- Set up a trade zone and modern market to distribute goods from other regions
- Small market
- Railway station
- Public park / playground
- Small vendors around public spaces
- Constructing warehouse
- Small medium business
- Upgrade existing market
- Development of a hotel zone
- Create a night market for street vendors
- Low-cost housing
- Electric power plant
- Car parking and bicycle parking
- Improved basic infrastructure
- Food court and restaurants in strategic locations, such as along the high way
- Move airport and upgrade to better standard

Organization solutions

- Business training
- Improved education
- Cutting edge technology
- Improved possibilities for young citizens to set up a business
- Improved coordination between involved actors; GAD, Community, Regional government, Union government, Department of agriculture land management and statistics, City development committee
- Set up Market committee, Park committee and Housing committee

Financial solutions

- Taxes
- Rental costs from shops
- BOT system
- Contribution from local community
- Cost from selling shops
- Loans
- Government budget

Institutional solutions

- Promote local and international investments
- Construction laws and permits
- Land use permit
- Myanmar national building code
- Railway policies and laws
- Condominium laws
- Regulations of tender
- Housing law
- URDD law
- Highway policies
- Municipal laws
- Trade policy

Kalaymyo Market proposal

The core team were specifically focusing on the redevelopment of Kalaymyo Market. Mapping of vulnerable groups and communities in the market area were identified as part of enable their integration in future planning process

The identified list was the following:

- Daily Wage Labourers
- Salesgirls/ -boys
- Cleaners
- Domestics workers
- Transportation workers (car, trishaw, motorcycle)
- Security guards
- Panhandlers
- Children
- Street vendors outside the market area

In addition, other important stakeholders are:

- Communities with living close to the market
- Market committee
- GAD
- TDC
- Farmers
- Costumers
- Wholesaler

A series of meetings were held with the vendors, customers, the market committee members and other stakeholders (identified above) of the market. Based on these meetings, the town proposed a new design for the redevelopment of the Kalaymyo Market. The redevelopment plan also included the concerns voiced by the vendor's committee and a list of demands previously submitted to the town authorities. The redevelopment plan is presented below:

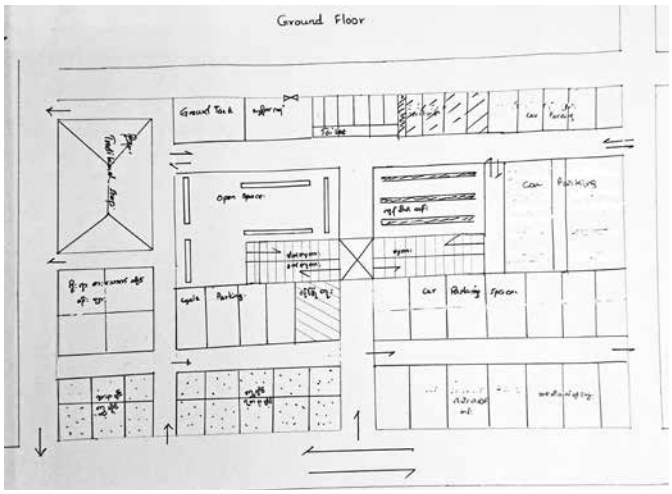

Figure 34: Ground floor market

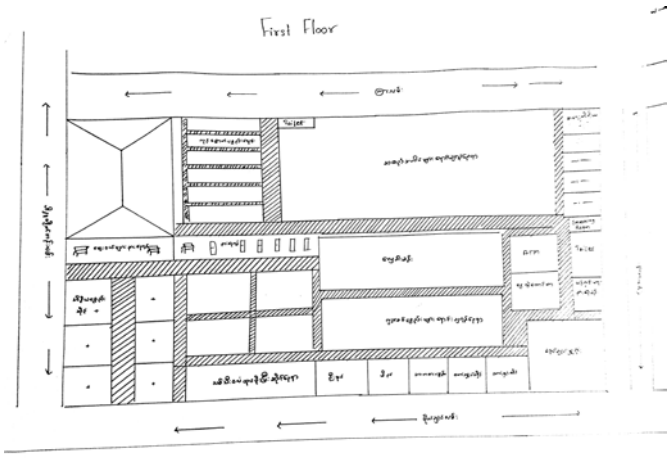

Figure 35: First floor market

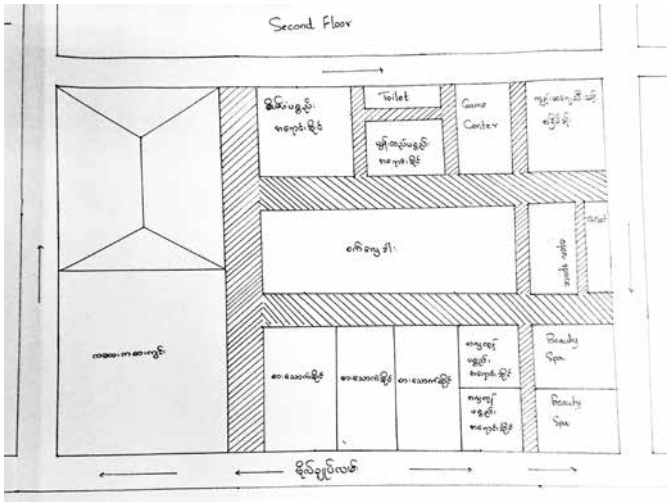

Figure 36: Second floor market

Specific parts of the proposal for market upgrade:

- Improved sanitation facilities through additional toilets
- Improved access for disabled and elderly
- Improved hygiene and cleanliness
- Fire system
- Waste management system
- Improved vending space
- Improve parking area, specifically for motorcycle and bicycles
- Improved traffic around market with zebra crossings, walkways and traffic signals

Integrated solutions

Some specific ideas for more integrated solutions, connecting the different urban systems in the overall proposal of economy and trade were proposed:

- Upgraded waste management in markets with organic waste being used for biogas development (waste/material and building)
- Hotel zone using renewable energy, e.g. solar panel on roof (Energy and building)
- Low cost housing with good water, electricity, waste management and infrastructure (Building, urban function, sanitation/water and waste/material)
- Wi-Fi in public space and on public transportation with online ticket system (ICT and traffic/mobility)
- Solar panel lightning in public spaces and markets (Energy, public space, urban function)

Figure 37: Illustration of the way different urban systems are connected in the proposal economy and trade.

Impact assessment

An impact assessment was done to analyse important ways of maximising positive effects of the proposal and minimise negative impacts during implementation.

IMPACT ASSESSMENT OF PROPOSAL – Economy and trade					
Type of Impact	**Target Group**	**Positive Outcomes**	**Negative Outcomes**	**Short/Medium/ Long Term**	**Measures to max. positive & min negative impacts**
Local economic development	• Market users • Traders • Investors • Farmers • Labours	• Job opportunities • Increased income	• Migration • Slums • Urbanization • Expensive lands • Crimes	Medium term	• Investment laws • Land use control • SME zone • Support loans
Poverty reduction	• Poor population	• Increased living standard • Increased education level	• Land use problem • No land for the poor	Medium term	• Land use policy • Low cost housing/ rental housing
Increased revenue	• Government • Private • Investor • Public	• More taxes • Sustainable services	• Higher preservation cost	Short/medium term	• Good management and leadership

Strategy for implementation

Specific core parts of the project were further developed into an implementation and maintenance strategy:

PROJECT			MANDATE/STAKEHOLDER	
THE WHAT	**THE WHEN**	**THE HOW**	**IMPLEMENTATION**	**MAINTENANCE**
Trade Zone	Long term	• Vendors • Warehouse • Parking • Whole Sale Center • Money changer • Bank • Microfinance • Sample showroom • Information centre • Committee office • Fire station	• GAD • City development committee • Investors • Ministry of Construction • Ministry of transportation and communication • Planning department • Myanmar custom	• Union of Myanmar Federation of Chambers of Commerce and Industry
Hotel Zone	Medium term	• Layout design and plan • Electricity (renewable energy) • Green space • Internet • Waste Management • Hotel committee	• Tax department • Ministry of Tourism • International investors • Hotel owners	• International and local hotel owners
Upgrading of market	Short term	• Fire safety • Car parking • Money changer • Public toilets • Elevator • Restaurants	• Market committee • Constructor • GAD • TDC • Planning department • Fire station • Ministry of electricity and energy • City development committee	• Market committee

Low cost housing	Short term	• Housing • Public Space • Water, Electricity, and infrastructure • Waste management • Sanitation committee	• Ministry of construction • Regional government • Parliament • Private company • GAD • Investors	• Housing maintenance committee • DUHD • GAD
New Railway	Long term	• Train station • New railway and train • Cable • Survey and design • Compensation of land	• Ministry of transportation and communication • Myanmar railway department • Land owners • Regional government • Parliament	• Myanmar railway department • BOT investors

The hindering and helping forces were examined to get a better understanding of how to mitigate the potential forces that might delay project implementation.

Hindering/helping forces for implementation

Hindering forces:	Helping forces:
1) Land compensation 2) Land use conflicts 3) Weak stakeholders' participation 4) Budget limitations 5) Tax 6) Public objection 7) High rental costs 8) Lack of space 9) Land allocation for trade zone 10) Low number of tourists and opportunity for small scale businesses 11) Market	1) Investments from both local and international 1) Budget allocation 2) Interest from hotel owners 3) Land ownership 4) Community participation 5) Technology 6) Support from local government 7) Laws and regulations 8) Raw material 9) Support from costumers

5.4 Urban-rural linkages

Urban-rural linkages are important for the sustainable development of the Kalay region including 41 village tracts, and 19 urban wards. The proposal builds on various dimensions with both physical improvements to increase connectivity, service provision, increased economic development, job opportunities and trade as well as vocational training and information technology.

Figure 38: Thematic proposal, urban-rural linkages

Key aspects of proposal

- Upgrade road infrastructure, construct bridges, and improve railway service for improved connectivity between different villages and Kalay town.
- New organic farming technology within the agricultural sector providing food in Kalay and other regions.
- Preservation of green areas and forests.
- Increase greenery in Kalay, along roads and in public spaces.
- Provision of students housing and public housing.
- Three town extension areas to provide housing opportunities and relocation plan for affected vulnerable communities along the river.
- Restriction of excavation of natural resources as well as sand and rocks from Myittha river.
- Embankments and flood mitigation measures along the river.
- Improved access both in Kalay and villages to social services, health centres, schools, youth centres, public spaces and playgrounds.
- Provision of vocational training to increase education level and employment possibilities.
- Collaboration between agricultural sector and weaving school.
- Set up warehouses and industry zone for small scaled business.
- Upgrade village markets.
- Increased economic connections and collaboration between different villages as well as Kalay.

Specific sustainability indicators that have been incorporated in the proposal:

- Accessibility to school education
- Accessibility to health care services
- Resilience to landslides and flooding
- Connectivity between urban and rural areas
- Possibilities for value added agriculture
- Local economic development

Specific improvement projects

Physical solutions

- SME zone
- Village and Kalay market upgradation
- New roads
- Three new bridges
- Warehouse
- ATM/mini bank
- Viewpoints
- Agricultural exhibition
- Railway extension
- Railway station
- Housing development
- Recreation centre
- Retaining walls
- Research centre with development of resilient crops
- Zoo and botanic garden
- Training centre for organic farming

Organization solutions

- Form a construction committee, feasibility study, and QC committee for railway
- City development committee and GAD for market upgrading
- Form a design group for railway station
- Small-scale development department
- Environmental conservation committee
- Maintenance committee and city development committee
- Radio station and online education
- Promote community participation
- Training to farmers on improved planting methods
- Vocational training for youth

Financial solutions

- Maintenance fee in the markets for improvements and maintenance.
- Entrance fee from visitors in weaving school.
- Bridge user fee
- Entrance fee from zoo and botanical garden for maintenance
- Income from selling land for town extension
- Land rental cost from SME business
- Public investments for construction of services such as schools and hospital
- Public investment for viewpoint
- Support loans for farmers

Institutional solutions

- Tender system and payment system
- Quality insurance for building and machine
- Control extracting rocks and sands from river
- Relocation plan for flood affected communities who live along the river
- Registration of business licenses
- Quality assurance of raw materials
- Amend the land use policy
- Limitation of building permits on agricultural land

Integrated solutions

Some specific ideas for more integrated solutions, connecting the different urban systems in the overall proposal of urban-rural linkages were proposed:

- Building bridges and upgrade the roads between town and village (Mobility/traffic and urban function)
- Public transportation with accessible bus stand for all groups and lights with solar panels (Public space, energy and traffic/mobility)
- Waste material for energy generation, e.g. biogas (Waste/material and energy)
- Recreation zone combined with recycling of waste and exhibition (landscape/ecosystem, public space and waste/material)

Figure 39: Illustration of the way different urban systems are connected in the proposal urban-rural linkages

Impact assessment

An impact assessment was done to analyse important ways of maximising positive effects of the proposal and minimise negative impacts during implementation.

IMPACT ASSESSMENT OF PROPOSAL – Economy and trade					
Type of Impact	**Target Group**	**Positive Outcomes**	**Negative Outcomes**	**Short/Medium/ Long Term**	**Measures to max. positive & min negative impacts**
Access to school and education close to citizens	• Children • Women • Men • Elderly	• Increased education level • Create job opportunities • No need to travel to access education		Long term	• Standard education system • Better access to school in village areas
Access to health care service	• Local community	• Improved information and visits • Improved social facilities		Long term	• Enable safe location and transportation • Put more effort on accessibility
Natural resilience	• Local community who makes business with selling sand and rocks from river	• Prevent landslide and flooding	• Low income and government can get small amount of tax	Long term	• Improve riverbank and retaining walls to prevent flooding and landslides • Legal restrictions
Improved transportation	• Vendor • Staff • Residents • Farmers	• Improved access and transportation	• Low income during construction • Land tenure and compensation	Short and long term	• Alternative places for vending and temporary access • Compensation on market price level

Value-added industry	• Small business group • Farmers • Local community	• More job opportunities • Purchase of products to lower price • Increase of income	• Use if chemicals	Short term	• Control through law against use of chemicals
Good market flow	• Vendors • Local community • Farmers • People in garment business	• Job opportunities • Improved selling possibilities • Increased income	• Competitive market	Long term	• Online selling which is space efficient

Strategy for implementation

Specific core parts of the project were further developed into an implementation and maintenance strategy:

PROJECT			MANDATE/STAKEHOLDER	
THE WHAT	**THE WHEN**	**THE HOW**	**IMPLEMENTATION**	**MAINTENANCE**
Connectivity	Short term	• Bridge to Kyun Taw village and Inn Tine village • Bridge to Sharr Taw and Second village • Bridge between Pyin Lar and Myint Lar • Upgrade the road along Second village and Bogyoke road	• Bridge management department • Ministry of electricity and energy • GAD • Community • Member of parliament • Forestry department • Road management department	• Bridge management department • Road management department • Community
Vocational training	Short term	• Establish agricultural school to do research about organic farm and agriculture • Set up weaving and textile school and distribute to international market • Manage systemically waste from textile factory	• Agricultural Mechanization Department • Department of Agricultural Research • Department of Agriculture Land Management and Statistics • Small-scale Industries Department • Irrigation and Water Utilization Management Department • Department of Agriculture • Community • GAD	• Department of Higher Education • Community
Conserve natural resources	Medium term	• Relocate flood affected communities along the river • Information campaign to minimise trash in the river • Control of excavation of sand and rocks from river • Build retaining wall along Myit Thar river and Zee creek	• Member of parliament • Department of Social Welfare • Environmental conservation department • Irrigation and Water Utilization Management Department • Department of Agriculture Land Management and Statistics • Community • GAD • Member of parliament	• Department of Agriculture Land Management and Statistics • Irrigation and Water Utilization Management Department • Community • GAD

Small medium enterprise business	Medium term	• Promote SME business • Build warehouse to save goods and products • Extend market • ATM machine in villages	• Ministry of Transport and Communications • Department of Agriculture • Textile factory owners • Community • GAD • Member of parliament • Business man/women	• Small-scale Industries Department • Bankers • Business man/ women • Community
Information technology	Medium term	• Establish radio station • Share knowledge about cutting-edge agricultural methods and textile online • Online marketing training	• Small-scale Industries Department • City development committee • Communication department • Community • GAD • Member of parliament	• Ministry of Transport and Communications • GAD • Community • Business man/ women

The hindering and helping forces were examined to get a better understanding of how to mitigate the potential forces that might delay project implementation.

Hindering/helping forces for implementation	
Hindering forces:	**Helping forces:**
1) Natural disasters 2) Budget limitations 3) Degradation of ecosystem 4) High interest rate for loan 5) Lack of environmental conservation and knowledge among citizens 6) Small market 7) Regulations 8) Lack of technical expertise and research 9) Lack of coordination between actors, 10) No market for SME	1) Existing road network 2) Good participation among organisations 3) Land ownership 4) Existing electricity infrastructure 5) Good connectivity and accessibility 6) Support from international organisations 7) Existing laws and regulations 8) Strong support from government 9) Natural resources 10) Governmental budget

5.5 Green/blue infrastructure and disaster risk reduction (DRR)

The development of the green and blue infrastructure in Kalay is crucial for mitigating the risks of flooding. The proposal has a broad perspective and includes specific solutions for overall environmental impact and improved greenery with emphasis on the management of flooding and solutions for communities living in risk areas.

While Kalay has a large amount of green cover, the green cover is concentrated in a few areas. The proposal recognises therefore the need to increase the green cover of the city, especially along pedestrian pathways and public spaces. As most of the existing greenery is in private properties the perspective of public access and insurance of trees in the city was incorporated as parts of the redesign of main roads and public spaces.

Development of a proper waste management system regarding both the physical perspective of segregation of organic and non-organic waste in the town to reduce the amount of waste going to the landfill sites as well as a public campaign to inculcate the practice among the town's population are parts of the proposal.

One of the most urgent development challenges in Kalay is the resilience to flooding, both for managing seasonal floods and extreme situations. This includes both increased capacity of the drainage system, cleaning of solid waste in drains, building controls, flow of internal waterways including creeks and streams, flood management and proper planning of city expansion areas.

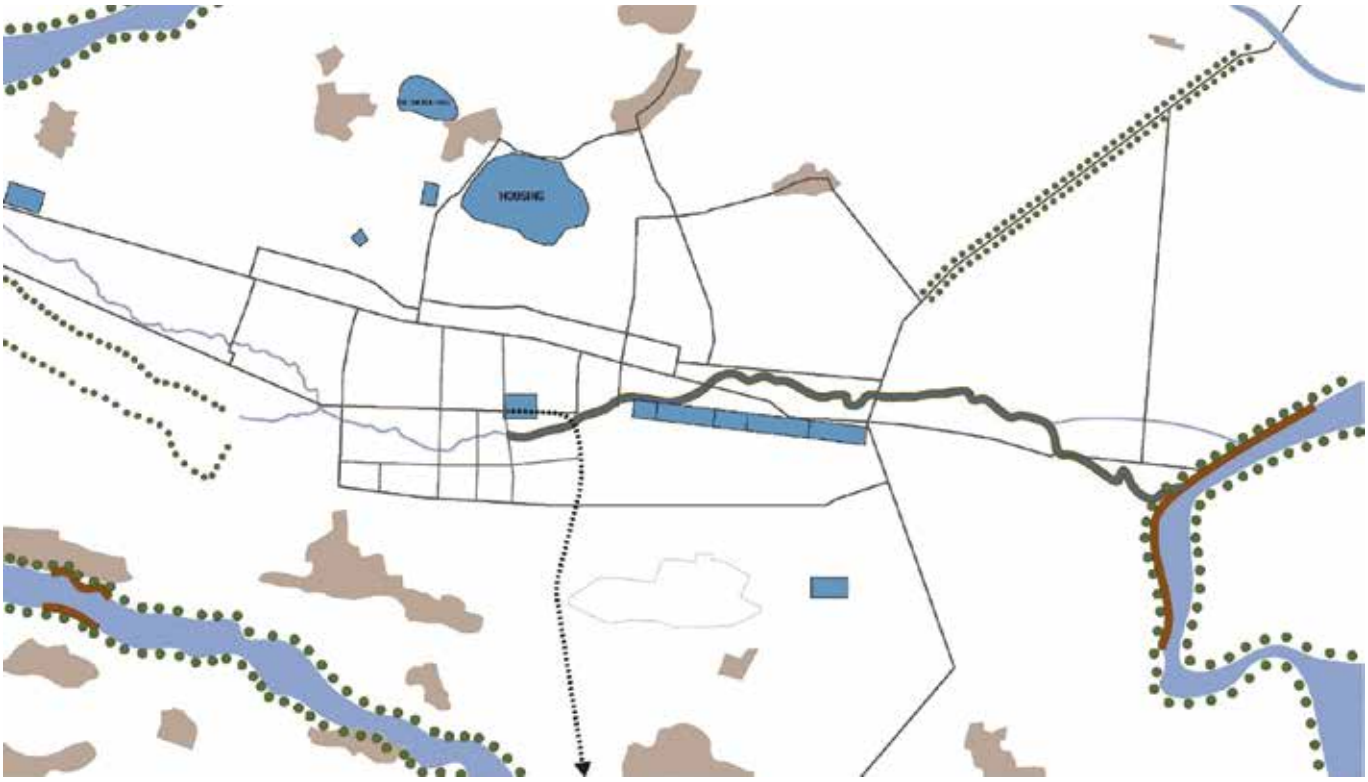

Figure 40: Thematic proposal, Green/blue infrastructure and DRR

Key aspects of proposal

- Increased greenery along streets, main roads and public spaces.
- Flood management plan and measures to prevent flooding along Myint Thar river, Zee creek, U Poke creek and Sal Gyi creek.
- Upgrade road connectivity for improved accessibility for emergencies and trade.
- Move the airport to the outskirts of the town and develop the existing airport into a public space and emergency shelter.
- Energy production power plant converting waste to energy and fuel for public transportation.
- Waste management plan and system.
- Improved drainage system for Kalay.
- Upgrade U Poke creek to ensure clean water access for local community and create a space for recreational area and increased biodiversity.
- Water collection pond combined with recreational area.
- Development of renewable energy.
- Housing for flood affected communities.
- Environmental exhibition to create awareness about climate change and the environmental vulnerabilities of Kalay including display of photos, analysis and response from the severe flooding event in 2015.
- Knowledge development and vocational training regarding agriculture, disaster risk reduction, waste management and climate change.

Specific sustainability indicators that have been incorporated in the proposal:

- Biodiversity and ecosystem services
- Green space for recreation
- Erosion and deforestation
- Reduced air pollution
- Reduction of landslides next to river
- Access to safe emergency roads

Specific improvement projects

Physical solutions

- Cutting edge technology
- Tree planting along roads
- Tree replanting along rivers to prevent landslides
- New park in the city
- Upgrade garden
- Retaining wall along U Poke creek
- Recreation area along U Poke creek
- Agricultural Research Center
- Housing project
- Environmental exhibition
- Disaster and emergency shelter
- Build playground both private and public
- Maintain green areas
- Relocation of airport
- Waste management system
- Construction of bridges
- Flood management through prevention, protection and adaptation
- Improved main roads for emergency exit during monsoon season.
- Develop evacuation places
- Flood resilient buildings
- Environmental exhibition

Organization solutions

- Improved collaboration between involved actors: Regional government, Department of hydropower implementation, TDC, Ministry of resource and environmental conservation GAD, Ministry of social welfare, relief, and resettlement.
- Guideline for disaster risk areas
- Design guidelines for new housing area
- Data collection
- Digital analysis and mapping
- Invite DRR experts to give training
- Preparation for disasters, both prevention and evacuation
- Inter-regional cooperation between the states of Sagaing and Chin.

Financial solutions

- Public investments
- Land compensation
- National and regional investments for flood management

Institutional solutions

- Forestry law
- Highway law
- Prevention of deforestation
- Control of development projects in flood risk areas
- Preservation of existing green areas
- Integrate DRR into master planning, infrastructure planning, and site planning.
- Land use zoning
- Land sub-division
- Building control
- Greenfield development

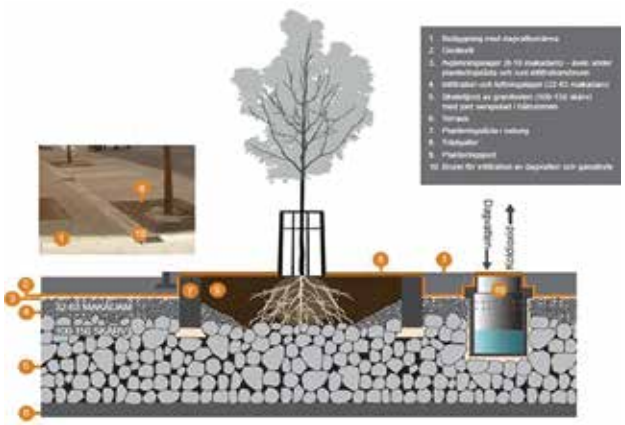

Figure 41: Example of integrated drainage solution

Figure 42: Two examples of local storm water management solutions from the visit in Norra Djurgårdsstaden, Sweden. Storm water is managed as a resource that provides for aesthetic values and serves as irrigation for greenery.

Specific proposal for flood management

Specific solutions for flood management were developed with support from the flood management expert Carsten Staub. They build on the following aspects:

- Prevention - Prevent the flood from reaching the community – flood storage/detention/diversion
- Protection - Built defences/embankments/protect the most valuable areas
- Adaptation -" Living with floods"/preparedness/forecast & early warning/save lives through protected escape routes

Principles for future flood management strategy:

- Use principle of **"working with the river"**, making use of the most stable features of existing river planform to the extent possible, and integrating existing river engineering works.
- In pragmatic manner, look for **"opportunities of the moment"** to stimulate river development towards the set goal in terms of river corridor width and a preferred future planform by giving priority to cost effective works (principle of picking the "lowest hanging fruits")
- Preference to **"no regret"** interventions as far as possible, to minimize structural works being abandoned in possible future plan changes
- Using **proven technologies** with minimal uncertainties, for maximum cost efficiency of structures
- In a **"learning by doing"** approach, follow river development, impacts of implemented interventions and structural performance by monitoring, analyses and updates of strategy and designs.

Specific flood management solutions for Kalay:

- Inter-regional cooperation, possibly through a River Basin Authority
- Flood inundation maps based on good topographic data, hydraulic modelling and hydrologic analysis
- Flood hazard maps by combining with flood vulnerability maps
- Mapping of land slide vulnerability
- Include new information in new urban plan that includes a flood management plan
- Reforestation as part of long-term solution
- Learn from the 2015 experience – analyse it
- Nature is strong - urban planning with respect for nature
- Base future planning and development decisions on accurate data and analysis.

Possible solution to the bank erosion problem in the town's eastern side

- Bank erosion protection (under water, rock material, with falling apron) could be an emergency measure to halt/reduce the ongoing erosion (maximum length of up to 500 meters). It is important to protect the monastery and the community centre immediately.
- A more long-term measure would be a loop-cut upstream, along an old abandoned channel. If it works it will increase erosion pressure on the large deposition area and gradually create a bend with a more favourable flow angle and reduced erosion attack downstream. The present loop has high resistance due to a constrained section (maybe less erodible bank material), which means the loop-cut will have a better chance to succeed.
- An alternative to the loop cut would be deflecting groynes on the right bank downstream of the deposition area along the left bank. This to obtain a similar effect as the loop-cut. The alternative may be more expensive and less effective.

Figure 43: Example of bank erosion protection through revetment composed of sand-filled geotextile bags

Solutions and Analysis of hill streams on the Kalay-Chin border

- These are inherently instable due to the high sedimentation as they enter the alluvial fan. These may suddenly change their direction which can lead to a lot of destruction if they enter town areas. A relocated airport could create one fixed reach, but there may be other parts to check. There is a need for good set of topography data (DTM) to do a proper study. Potential location of stream channel shifts can then be identified and structural measures to prevent it could be implemented.
- The Southern hill stream gets very close to some communities which increases the risk for high social impact in future flooding events.

Emergency Preparedness Plan

- It is vital to create an emergency preparedness plan with the cooperation of multiple agencies and authorities in the area. Test drills and the organization of the emergency response teams must be done in order to assess the efficacy of the response preparedness.

Diversions of run-off

- Storm water runoff must be taken care of in Kalay town with more solid and impermeable surfaces. At the same time, it would significantly improve the situation in town if creeks from the hill streams could be diverted so that they did not cross the town area. This should not be a permanent diversion – only diversion of extreme flows.

Phasing of the flood mitigation component

A three-phased approach is suggested to develop a Kalay Flood Management Plan. The three phases would constitute the following:

Phase I	• Create and analyse DTM for extended Kalay flood area – after determining the most suitable method • Collect and analyse hydro-meteorological data – to determine the severity of the 2015 flood event • Collect and analyse remote sensing data for river morphology • Conclude on usefulness of mathematical modelling (2D)
Phase II	• 2D mathematical modelling of 2015 flood event • Compare results with remote sensing data • Assess the need for sediment erosion/deposition modelling
Phase III	• Carry out sediment erosion/deposition modelling (if required) • Preliminary Flood Management Plan (10-year implementation)

Integrated solutions

Example of specific ideas for more integrated solutions and resilience, connecting the different urban systems in the overall proposal of green/blue infrastructure and DRR:

- Flood mitigation measures and development of housing for flood affected communities (landscape/ ecosystems, buildings, urban functions)
- Development of new public spaces for improved access for different groups, increased greenery, and integrated drainage solutions leading to improved green area coverage and ecosystem services (Mobility/traffic, public space, landscape/ecosystem)
- Reuse and recycling of waste and turn into energy and fuel for public transportation (waste/material, mobility and energy

Figure 44: Illustration of the way different urban systems are connected in the proposal of green/blue infrastructure and DRR.

Impact assessment

An impact assessment was done by the core team to analyse important ways of maximising positive effects of the proposal and minimise negative impacts during implementation.

IMPACT ASSESSMENT OF PROPOSAL – green/blue infrastructure and DRR					
Type of Impact	**Target Group**	**Positive Outcomes**	**Negative Outcomes**	**Short/Medium/ Long Term**	**Measures to max. positive & min negative impacts**
Biodiversity and ecosystem services	• Communities in flood affected areas • Residents in Kalay	• Increased flood resilience • Increased green area coverage		Short term	• Engage with community • Cooperate with experts
Increased green space for recreation	• Residents in Kalay	• Fresh air • Green corridor	• Potential spot for drug use of young people • Littering	Short term	• Increased control • Security plan
Decreased soil erosion and deforestation	• Residents in flood affected areas	• Less people affected by flooding • Sustainable solution to flood mitigation • Decreased change of river planform and shallowness of river		Medium term	• Build river embankment and plant more trees along river • Share awareness
Reduced air pollution	• Residents in Kalay	• Improved health • Less environmental impact	• Challenges for industrial business	Long term	• Increase green coverage and trees • Cutting-edge technology in industrial sector
Maintain riverbank	• Residents	• Flood mitigation • Less worry for communities along the river • Minimised destruction of property and agricultural land		Short term	• The plan should be managed by experts not to harm ecosystems • Technology
Upgrade road connectivity for emergency use	• Residents • Farmers	• Improved emergency preparedness	• Land allocation • Farmland being used for road extensions	Medium term	• Maintain existing roads

Strategy for implementation

Specific core parts of the project were further developed into an implementation and maintenance strategy:

PROJECT			MANDATE/STAKEHOLDER	
THE WHAT	**THE WHEN**	**THE HOW**	**IMPLEMENTATION**	**MAINTENANCE**
Embankment and tree planting	Short term	• Prioritizing places • Make assessment • Analysis of rivers • Construction	• Forestry department • Local community • Member of parliament • Regional government • Construction committee	• Company • BOT (Build/Operation/ Tax fee)
Environmental exhibition	Short term	• Constructions of exhibition • Trainings with experts • Information and news • Communication • Services	• Forestry department • City development committee • Environmental conservation department • Member of parliament • Regional government	• Member of parliament • Regional government • Forestry department • Construction committee
Upgrade roads for improved connectivity	Medium term	• Field visits for evaluation of existing situation and possible improvements • Form a committee to cooperate with community • Land compensation • Road construction • Feasibility study	• Road development department • Department of Meteorology and Hydrology • TDC • Community • Department of Electric Power and Planning • Committee	• Road development department • TDC • Community • Committee
Public space	Long term	• Improve public access • Safety measures • Promote public participation • Construction of park and public space	• Department of Social Welfare • Department of Public Health • GAD • Member of parliament • Regional government	• Department of Social Welfare • GAD • TDC
Recycle waste and turn into energy	Long term	• Waste management plan • Information and awareness campaign • Waste management units • Energy production units	• TDC • Department of Electric Power and Planning • Community	• TDC • Department of Electric Power and Planning • Community

The hindering and helping forces were examined to get a better understanding of how to mitigate the potential forces that might delay project implementation.

Hindering/helping forces for implementation	
Hindering forces:	**Helping forces:**
1) Budget limitations 2) Relocation will affect ownership of land for communities 3) Technology 4) Existing regulations 5) Existing farm land	1) Building material 2) Community/CSO engagement and willingness 3) Labour force 4) Land availability

6. Recommendations from the Kalay SymbioCity Programme

The SymbioCity Capacity Building programme has provided new knowledge and competence in urban sustainability. The interdisciplinary core team with representatives from local, regional and national level have given opportunities for new collaborations, tools, methods and solutions for the future. The aim of the training sessions has been to improve capacity for urban planning, urban design, urban development and urban management. Stakeholder collaboration and public participation were mainstreamed throughout the activities, along with poverty reduction, gender equality, economic and environmental sustainability. The implementation of the programme has given lessons learnt and knowledge that can be useful to scale up in the future, in Kalay as well as on national level.

6.1 Integration of SymbioCity in Kalay

The core team identified important aspects and parts of the strategy that can be brought into future projects and processes in Kalay.

- The most urgent key projects for development of Kalay where identified to be (i) Proactive measures for flooding based on research; (ii) Market development and regional connections including public transport; (iii) Public space development; (iv) Secure housing including environmental and social perspectives.

- As the government officers and staff members from local government agencies and local organizations joined the program, the participants got the chance to get to know each other, which led to strengthened coordination among these organizations in urban development activities. In the future it will support the achievement of increased coordination among departments through collaborative work and use of the SymbioCity tools and methods. Specific activities are defined down for the continuation of the collaborative work.

- Continuation of the close work between regional government, professionals, parliament representatives, local departments, residents, academia and civil society will improve the development of Kalay. Integration of tools for more participatory processes and involvement of different groups and citizens will give better knowledge of the needs of people.

- Tools used during the SymbioCity programme to develop sustainable solutions specifically expressed as useful in Kalay were; (i) Social inclusion; (ii) Flood assessments; (iii) Impact assessments (including environmental impact, cultural heritage impact, social impact, child impact); (iv) Integrated systems; (v) Increased citizen's participation.

- Awareness of the fact that urbanization would increase globally in the future and the population growth in Myanmar further emphasise the importance of sustainable growth, local economic development, linkages between urban and rural areas, development of infrastructure and service provision in the town of Kalay.
- There is a need for technology, finance, social and urban planning as well as coordinated processes to handle challenges to create sustainable and integrated solutions for environmentally, economically, socially, culturally and spatially sustainable cities.

- To take a holistic approach to urban systems, considering public health, public safety, water supply, energy, transportation and traffic management, waste management, telecommunications, green areas and public space gives improved sustainability and financial efficiency in project implementation.

- Important aspects of good urban governance, rule of law, transparency, social accountability and participation of civil society are important factors in urban development to serve the best interest of citizens. Laws and policy are also an important institutional aspect to take into consideration to bring about necessary changes in urban governance and management.

- Ways forward for the best use of land in both urban and rural areas are through effective legal framework, town plans and urban designs, integrating open space, communal land, public space and urban landscape.

- Improved decision making need data reliability. This can be done through i.e. mapping, GIS analysis and data collection. Jointly identified challenges and opportunities, vision and development strategy can guide new projects and developments.

In addition, the core team proposed some specific activities for how they can take the collaborative work forward in Kalay:

Kalay SymbioCity methodology Group

- Training of relevant stakeholders in the methodology of SymbioCity
- Continue to develop the work with the proposed park and market upgradation
- Serve to provide ideas and think critically about sustainability analysis in future projects in Kalay

Kalay Pilot Project

- Create a multi-departmental group with the explicit mandate to work on a pilot project, integrating the SymbioCity methodology and tools
- Implement the proposed projects in the strategy for 2040

Kalay SymbioCity Education Group

- In collaboration with Kalay University, the core group led by a team of facilitators could run a short version of the SymbioCity training
- Target group: University students and high school students
- Establish an urban planning library at the university that is publicly accessible.

Kalay Climate Change Exhibition

- Develop an exhibition that combines awareness raising and collects citizen's feedback
- Focus on the experiences and memories of the 2015 floods
- Include citizens in the process of envisioning a sustainable and resilient future for Kalay

6.2 Town Plan

Based on the work and strategy of Kalay 2040, recommendations for the development and revision of the Town Plan have been identified.

The Kalay town plan is recommended to include the following key thematic strategies

1. a blue-green infrastructure strategy
2. a flood management strategy
3. a mobility strategy that encompasses public transportation, non-motorised modes of transportation, increased connectivity to between rural and urban areas and increased greenery
4. a waste management plan
5. a local economic development strategy, including the perspectives of transnational trade
6. a housing strategy for flood affected communities

Make the town plan process more inclusive and inter-disciplinary

The current town plan process mimics the institutional structure of urban planning and governance in Myanmar. The process remains highly centralised and does not effectively include the vast array of stakeholders that make up the socio-cultural tapestry of a town like Kalay. The town plan process is recommended to include two key elements:

- The process includes a meaningful level of public participation where stakeholders from civil society, the private sector, and most importantly, concerned citizens are provided an avenue to voice their concerns, provide critical feedback, and jointly participate in the creation of a vision for their town.

- The process includes both elements of greater horizontal cooperation, between departments, ministries, and agencies at the same level of governance, and greater vertical streamlining between stakeholders at the township, state/region, and union levels. Interdepartmental collaboration yields better outcomes, lowers cost, and generates innovative ideas

Take issues of poverty and gender in urban planning into account when developing the town plan

In order for Kalay to develop in an inclusive and sustainable way, that takes consideration of different needs, independently of gender or socio-economic group, it is important to recognise that different groups have different needs and perceptions. In Kalay, key stakeholder interviews, consultations and analysis by the core team gave clear indications on differences in access to space, resources and services between different groups, marginalized communities as well as between informal and formal sector. To strengthen these perspectives in the new town plan would ensure an improved situation for all citizens in Kalay.

Pay attention to issues of social inclusion

Issues of social inclusion of marginalized groups as well as people living with disabilities was highlighted by the core team during the programme. Planning with different types of abilities and disabilities in mind will make cities more inclusive and functional to more people. This is linked to for example design of and access to markets, roads, public transport, seating places.

The town plan must rely on more accurate data for planning

Local data is a crucial component in understanding the reality of the town and making informed planning decisions based on knowledge and facts. Improved tools for data collection, analysis and joint decision making is recommended for the future town planning process. Several participants highlighted the importance of new tools such as GPS mapping, walk through evaluations, primary data collection, traffic analysis as important means for future planning.

Include integrated planning solutions that can create synergies

Integrated planning solutions can create synergies among urban systems in order to reduce both impacts and costs. All urban systems planning in Kalay should consider both strategies and integrated solutions based on inter-system synergies, to enhance efficiency and reduce costs. Institutional arrangements that support inter-functional collaboration should be developed. In the strategy and proposal for Kalay integrated solutions are developed that connect the specific thematic areas to a set of environmental, economic, and socio-cultural factors. These factors are: buildings, urban functions, public space, landscape & ecosystems, waste and materials, water and sanitation, energy and ICT.

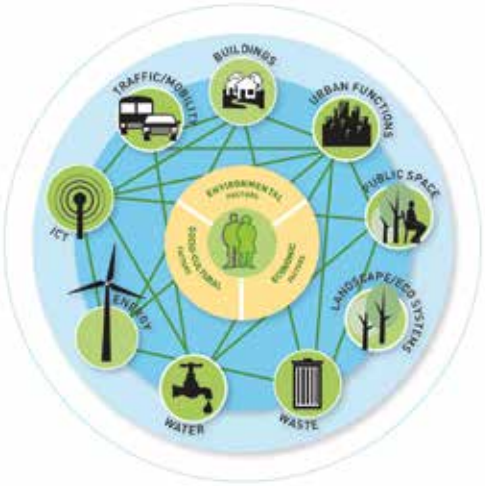

Figure 45: Integration of solutions for urban systems

Town Plan process considers sustainability perspectives and impact assessments

Further impact assessments and inclusion of all dimensions of sustainability (socio-cultural, economical and environmental) in the town plan process and plan would enable a long-term positive development in Kalay and both inform and support conscious decision-making.

6.3 Implementation of the National Urban Policy

The National Urban Policy for Myanmar is under development and will act as an umbrella policy to existing or proposed national policies and will form direct policies to address specificities within the urban sector. Based on the lessons learnt from the implementation of the SymbioCity Programme in Kalay, the following recommendations have been developed for the implementation of the NUP:

1. Small and medium cities/towns

Apart from the three big cities of Yangon, Mandalay, and Nay Pyi Taw, most of the country's urban population lives in small towns. The challenges, opportunities, and capacities of small towns are often markedly different from bigger cities in the country which demands a recognition of tiered solutions. This regards the aspect of balanced regional growth, economic development and infrastructure provision.

2. Large rural population residing within "town" jurisdictions

The majority of "urban" centres in Myanmar, still contain a predominant rural population, however the development indicates that these townships will be the core of future urbanisation processes. Significant emphasis must be placed on understanding the urban-rural linkages within townships and the potential conflicts, challenges, and opportunities that arise with urban growth.

3. Gender and urban planning

Gender representation is acutely missing from the political and administrative systems of Myanmar. For instance, a recent Asia Foundation study finds that only 101 of the 16,829 Ward/Village Tract Administrators are women. The work and analysis in Kalay shows serious inadequacies in the existence of and access to public space, access to services, and safety and security of women. The different needs of women and other gender minorities will therefore be important to address with growing urbanisation.

4. Democratic participation

Participatory process involving citizens and local communities must be made a mandatory part of the town planning process and in the development of other urban projects. In addition, increased transparency and openness in urban development projects is crucial. The current status of environmental and social impact assessments is crucial to analyse for improved processes and results and to make the process of urban growth as transparent, democratic, and equitable as possible.

5. Decentralisation of governance

A roadmap for greater decentralisation of power to the townships, both fiscal devolution and devolution of responsibilities under the constitution is important. In the longer term, this roadmap must seek to transfer power completely to an elected body at the township level. TDC/CDCs have come to occupy central positions in urban governance and development and must be further empowered and capacitated to take on a larger role and fully redeem their constitutional potential. The implementation of the NUP should build on the promise of cities that are democratically governed and managed.

6. Informal settlements

The challenges of informal settlements are needed to be addressed by pointing to sustainable solutions including participatory in-situ upgradation, increased provision of affordable housing, and public housing solutions that are affordable for citizens. The rights of the citizens to the town should be in the centre of development.

7. Reference projects

During the Capacity building programme in Kalay, some specific projects of reference from the study trip to Stockholm and Umeå were pointed out as important references by the core team for the future development of Kalay.

7.1 The gendered Landscape

The city of Umeå works actively both strategically and practically to achieve a more gender equal city. To support the work with gender equality, the municipality has adopted a strategy for gender equality work. Gender equality must be included and applied in a concrete way in all stages of the decision-making process and in all documents that Umeå Municipality is behind. To ensure the institutional development and capacity development in social inclusion and equality the Municipality of Umeå decided to hire a Gender Equality Officer which has focused on improvements and specific projects targeting different groups in society. To open up the debate the Municipality has developed 'The gendered landscape tour of Umeå' which is a way of making statistics come alive and to demonstrate concrete effects of striving for gender equality. Work that has been led both by the municipality, but also by other organizations and persons in Umeå. The purpose of the bus tour is to highlight gendered powered structures in society and the city and to make statistics come alive; i.e. practically show how the gender equal efforts made by the municipality and organizations have led to positive development in several areas i.e. a sport arena, public spaces and pre-schools. The tour also shows examples of where gender equality is still lacking, and where more efforts need to be made.

Another example of the work of the Municipality is the project Frizon - Gender Equal Public Environments has transformed part of the park into a unique place to hang out in the city. Young girls in the municipality have, based on their interests and with gender equality as a method, researched and developed ideas and visions about the design of an inviting gender equality place. The goal has been to create a place free from expectations, fears and insecurity where everyone could feel welcome. Finally, the site is ready to use. To envisage successful gender achievements, the municipality organizes a bus tour called The Gendered Landscape. The tour includes visits to projects at.

Figure 46: The city has paid special attention to creating public spaces for young girls. This carousel was developed in collaboration with young women citizens.

7.2 Climate Change Strategy and storm water management

Climate and climate change is a cross-sectoral issue that concerns many activities and areas of expertise. Climate adaptation takes place and action is needed at different levels of society and by responsible actors. The county administrative board of Västerbotten has an important role and for many years the county has been working actively to develop climate and energy work in the county. The County Administrative Board of Västerbotten was commissioned in 2009 to coordinate regional efforts to adapt society to a changing climate. In 2013, the mission was complemented to include the work of following up on the climate adaptation work at municipal level and drawing up a regional action plan. The county action plan aims to provide guidance for actively meeting climate change, reducing vulnerabilities, taking advantage of opportunities for developing a long-term and robust society. Municipalities receive from the county a municipal report, GIS layers, map images, and 100-year rainfall model analysis.

Umeå have undertaken three types of solutions to tackle the problem of flooding and storm water management:

1. Focus on local, upstream solutions
2. Motivating clients to reduce storm water runoff in upstream areas
3. Implementing a holistic planning approach and design to development

One Another example of a localised, upstream system is the Tomtebo project where a storm water pond that would collect runoff from a 15-hectare residential area was created.

The pond's success depends on two key factors: pre-sedimentation of the storm water, and retention and cleaning of the storm water before it is released. This worked as a good example of a green-blue infrastructure project that solved the flooding problem but also created an aesthetically pleasing and socially acceptable public space.

Figure 47: The Tomtebo project is a storm water pond and an example of green/blue infrastructure project providing both a solution for flooding and a public space.

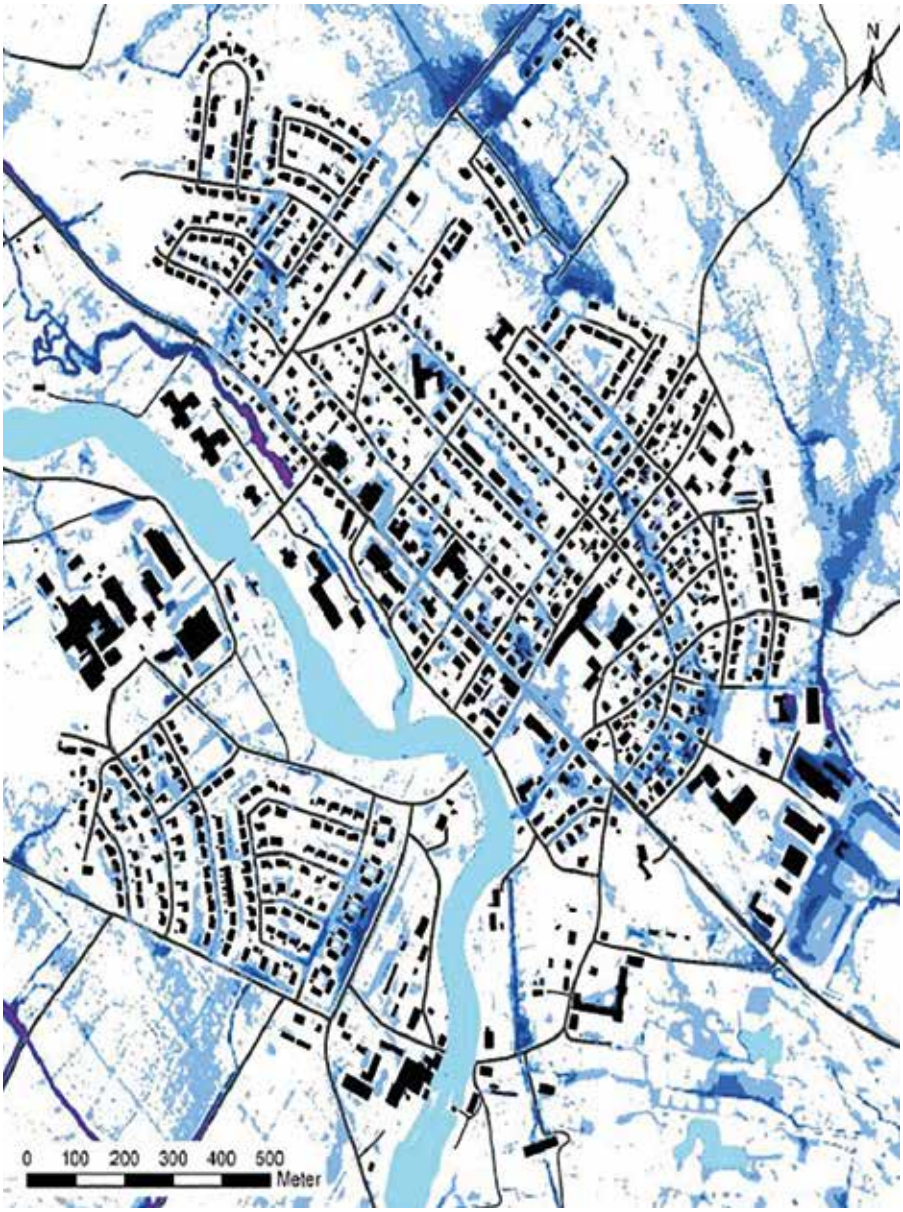

Figure 48: 100-year rainfall model analysis.

7.3 Collaboration between the Umeå Municipality and the University

Umeå Municipality and Umeå University have since 2012 a cooperation agreement to jointly meet the social challenges that climate change entails and develop Umeå to the northern power for sustainable urban development. Together they represent a good example of when new funding models also lead to new actors in city development processes where technology, markets and consumers are working together for sustainable and smart technologies and solutions. Umeå School of Architecture is part of Umeå University. The education aims to point clearly towards sustainable architecture and integrated design. It offers a five-year architectural programme leading to a Master of Architecture and a 3-years Bachelor of Fine Arts in Architecture.

SKL International
AFFILIATED TO THE SWEDISH ASSOCIATION OF LOCAL AUTHORITIES AND REGIONS

URDI

Swedish Association of Local Authorities and Regions

SymbioCity

Sweden
Sverige