OECD Development Pathways

Multi-dimensional Review of Thailand

VOLUME 3. FROM ANALYSIS TO ACTION
Multi-dimensional Review of Thailand

VOLUME 3: FROM ANALYSIS TO ACTION
This work is published under the responsibility of the Secretary-General of the OECD. The opinions expressed and arguments employed herein do not necessarily reflect the official views of the member countries of the OECD or its Development Centre.

This document, as well as any data and any map included herein, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

Please cite this publication as:
https://doi.org/10.1787/7ef9363b-en

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Photo credits: Cover © design by the OECD Development Centre.

Corrigenda to OECD publications may be found on line at: www.oecd.org/about/publishing/corrigenda.htm.
© OECD 2019

You can copy, download or print OECD content for your own use, and you can include excerpts from OECD publications, databases and multimedia products in your own documents, presentations, blogs, websites and teaching materials, provided that suitable acknowledgement of OECD as source and copyright owner is given. All requests for public or commercial use and translation rights should be submitted to rights@oecd.org. Requests for permission to photocopy portions of this material for public or commercial use shall be addressed directly to the Copyright Clearance Center (CCC) at info@copyright.com or the Centre français d’exploitation du droit de copie (CFC) at contact@cfcopies.com.
Foreword

Thailand embarked on an OECD Multi-dimensional Country Review (MDCR) in July 2017, seeking support to its ambition to become a high-income economy by 2037. The review is a first deliverable of the 2018-19 Country Programme between Thailand and the OECD and aims at supporting public action by the national authorities of Thailand in sustaining sustainable development and progress in the well-being of its citizens.

Development is not about getting everything right, but about getting right what matters most. Economic growth matters, but is just one facet of development. Policy makers are required to reconcile economic, social and environmental objectives to ensure that their country’s development path is sustainable and that the lives of its citizens improve. OECD MDCR help governments chart this path through the identification of key constraints and policy recommendations to overcome them.

MDCRs are composed of three distinct phases: Initial Assessment, In-depth Analysis and Recommendations, and From Analysis to Action. This approach allows for progressive learning and co-creation of reforms that fully respond to the country’s specific challenges and opportunities. Throughout, the process conjugates expert policy analysis with participatory approaches including Foresight and Governmental Learning that involve actors from the private and public sectors, civil society, and academia. Analytical work is based on all available statistics on Thailand, including well-being, macro- and microeconomic data, at national, sectoral, household and firm level, using both domestic and international sources.

This report provides a synthesis of the previous volumes and focuses on the Northern Region of Thailand. The recommendations made in previous volumes have been further prioritised and adapted during two policy dialogue events in Chiang Mai and Chiang Rai in November 2018.

Building on these dialogues and further analysis, this report proposes an action plan and a scorecard with key indicators to monitor progress. Together the ideas for action and the scorecard outlined here can be the basis for accompanying a process of discovery and strategy making in the Northern Region aimed at developing the region’s full potential. Such a process would ideally bring together all necessary stakeholders and proceed in an evaluative manner, using the indicators of the scorecard to measure the achievement of progress.
Acknowledgements

Multi-dimensional Country Reviews are the result of a collaborative effort of the OECD and the country under review. Work on the third phase of the MDCR of Thailand was carried out jointly by the OECD Development Centre and the OECD Environment Directorate, with excellent support from the Office of the National Economic and Social Development Council (former the Office of the National Economic and Social Development Board) in Thailand.

The review was produced under the guidance of Mario Pezzini – Director of the OECD Development Centre. The review was led and coordinated by Jan Rieländer, Head of Multidimensional Country Reviews at the Development Centre. It was drafted by Andrea Colombo and Jan Rieländer (OECD Development Centre), and Matthew Griffiths (OECD Environment Directorate). Vararat Atisophon provided excellent project management and statistical support. The review also benefited from the contributions made by Nhung Tran (OECD Development Centre) and Soojin Jeong (OECD Environment Directorate). Secretarial assistance was provided by Myriam Andrieux (OECD Development Centre).

The team is grateful for insightful contributions and comments provided by Juan De Laiglesia (OECD Development Centre), Ana Moreno Monroy, Oriana Romano and Håkan Tropp (OECD Centre for Entrepreneurship, SMEs, Regions and Cities), and Xavier Leflaive (OECD Environment Directorate).

Thosaporn Sirisumphand, Secretary General of the National Economic and Social Development Council (NESDC) supported the review. Pattama Tearavitsagool (Deputy Secretary General of the NESDC) and her team have been a valuable counterpart throughout the process, both technically and analytically. Ratnasapa Submuang, Chidabha Chitsampandhvej, Ampassacha Rakkhumkaeo, Potcharapol Prommatat and Duangruetai Surasakjinda played a key role in the continuous interaction between the OECD team, the NESDC and other representatives from the Government of Thailand. The MDCR team is moreover grateful to Arnunchanog Sakondhavat, Pataraporn Laowong, Boonchoob Songtragoolsak and Nisawan Pitchdumrong for having retrieved and shared key data.

Participants at two policy dialogue events, held in Chiang Rai and Chiang Mai in November and December 2018, worked through the findings and recommendations of the earlier MCDR reports, and threw the basis of the action plans. The workshops “Unlocking the potential of Northern provinces” held in Chiang Rai and Chiang Mai counted on the participations of staff from Public and Private sectors in Chiang Rai, Chiang Mai, Phayao, Lamphun and Lampang; the Provincial Government Office, the Provincial Administrative Organization, the National Statistical Office, the Office of Commercial Affairs, the Highway District, the Provincial Industrial Office, the Provincial Agricultural Extension office, the Provincial Land Office, the Customs Office and the Port Authority of Chiang Saen, the Federation of Thai Industries, the Chamber of Commerce, the Tourism Business Association, the Mae Fah Luang University, the Northern Science Park and the School of Public Policy in Chiang Mai University.
The workshop “Improving water management in the North” in Chiang Mai also counted on the participation of staff from the Provincial Waterworks Authority (Region 9) and the Ping River Basin Committee; Office of the National Water Resource; Maejo University; Upper Northern Region Irrigation Hydrology Center; the Electricity Generating Authority of Thailand; the Provincial Waterworks Authorities of Lampang and Lamphun; the Water Resource Regional Office; Department of Water Resource in Chiang Mai; the Lampang and Lamphun Irrigation Project; the Office of Commercial Affairs in Lamphun.

The OECD Team is moreover grateful to all the representatives of local administration and private sectors interviewed during field trips organised by the NESDC. In particular, the report benefited from insights by Chiang Rai Rajabhat University, Mae Fah Luang University, Ora-orn Poocharoen from Chiang Mai University, the Customs Offices of Chiang Saen and Mae Sot, Port Authority of Thailand, the Federation of Thai Industries of Chiang Rai; Chiang Rai and Tak Chamber of Commerce; the Electricity Generating Authority of Thailand; the Office of Commercial Affairs, the Employment Office, the Industry Office, the Agricultural Extension Office, the National Statistical Office, the Land Office, the Office of Natural Resources and Environment, the Irrigation Project, the Waterworks Authority, the Disaster Prevention and Mitigation Office, the Government Offices of Tak; and the Marine Office in Phitsanulok.

Finally, the team acknowledges David McDonald for editing the manuscript and the support of Delphine Grandrieux, Elisa Lopez Roldan and Elizabeth Nash from the OECD Development Centre’s Communications and Publications Unit with the production of the report.
Table of contents

Foreword .................................................................................................................................................. 3
Acknowledgements .................................................................................................................................... 5
Acronyms and abbreviations .................................................................................................................. 11
Executive summary ...................................................................................................................................... 13
  Developing the potential of Thailand’s North ....................................................................................... 13
  Improving the management of water security in the North ................................................................. 15
Chapter 1. Synthesis of multi-dimensional analysis: New capabilities for Thailand ......................... 17
  Initial Assessment: Thailand’s aspirations and key constraints to development ................................ 19
  Building policy recommendations: Thailand must implement three transitions to reach the next level of development ................................................................. 35
  References ............................................................................................................................................... 43
Chapter 2. Developing the potential of Thailand’s North: An action plan ......................................... 45
  The Northern Region: Context, challenges and opportunities for socio-economic development ....... 47
  Proposed actions: Building capabilities to exploit the full potential of the North ............................ 50
  The Action Plan: A summary .................................................................................................................. 72
  Notes ......................................................................................................................................................... 74
  References ............................................................................................................................................... 74
  Annex 2.A. Robustness test for the outcome of the Max-p clustering method .................................... 77
  Annex 2.B. Operationalising the product space methodology at the subnational level .................... 78
Chapter 3. Towards better management of water security in Thailand’s Northern Region ............... 81
  The Northern Region: Context, challenges and opportunities for water management .................. 82
  Clear vision and organisation empower regional actors to deliver their water management responsibilities ........................................................................................................... 84
  Robust, evidence-based decision making and policy frameworks prioritise regional action ............ 87
  Appropriate infrastructure solutions are selected with adequate capital and O&M budgets allocated ......................................................................................................................... 89
  The Action Plan: A summary .................................................................................................................. 91
  References ............................................................................................................................................... 93
Chapter 4. A scorecard to track sustainable development in the North ........................................... 95
  The scorecard proposes indicators for measuring implementation and performance of the action plan until 2037 ................................................................................................. 96
  Northern provinces develop capabilities to exploit their full potential .......................................... 96
  Northern provinces adopt a risk management approach to water security ...................................... 102
  Going forward: Measuring the SDGs at regional level for an integrated performance
  measurement framework ...................................................................................................................... 104
  References ............................................................................................................................................... 106
Tables

Table 1.1. People – four major constraints .......................................................................................... 21
Table 1.2. Prosperity – four major constraints .................................................................................. 24
Table 1.3. Partnerships and financing – three constraints ................................................................. 27
Table 1.4. Planet – five constraints ................................................................................................... 29
Table 1.5. Peace – four constraints ................................................................................................... 31
Table 2.1. Concrete actions to operationalise Smart Labs ................................................................. 52
Table 2.2. Data sources for the standardised cadastral database .................................................... 59
Table 2.3. Calculation of the Local Allocation Tax in Japan .............................................................. 61
Table 2.4. Current statistical definition of urban areas underestimates the size, potential and issues
of Northern cities ............................................................................................................................ 64
Table 2.5. Conditions to implement an effective transport authority .............................................. 66
Table 2.6. An effective strategy and strong LAOs drive the development of the North: Action plan .. 72
Table 2.7. Action plan to transform Northern cities into drivers of regional development .......... 73
Table 2.8. Action plan for Northern universities and colleges to become key drivers of regional
development ....................................................................................................................................... 73
Table 4.1. Key indicators to track the effectiveness of the new strategy of development of the North
of Thailand .......................................................................................................................................... 97
Table 4.2. Key indicators to track LAOs’ local fiscal capacity building ............................................ 99
Table 4.3. Set up liveable and functional metropolitan areas and transport authorities ................. 100
Table 4.4. Key indicators to measure the quality of services in metropolitan areas ....................... 100
Table 4.5. Making universities centres of entrepreneurship ............................................................ 101
Table 4.6. Measuring the entrepreneurship of the tertiary system .................................................. 102
Table 4.7. The transition towards a risk management approach to water security requires
empowered and evidence-based regional decision making as well as good infrastructure........ 103
Table 4.8. Enhance data capability to measure water security ......................................................... 104
Table 4.9. The scorecard is a multi-dimensional tool to track development of the North ............... 105
Annex Table 2.B.1. Top 10% sectors by RCA with significant average share of provincial
manufacturing value added .................................................................................................................. 78

Figures

Figure 1.1. Multi-dimensional Review of Thailand – Process ........................................................... 18
Figure 1.2. Current and expected well-being outcomes for Thailand: Worldwide comparison........... 20
Figure 1.3. Progress towards the Sustainable Development Goals (SDGs): People ......................... 21
Figure 1.4. Set up Bangkok metropolitan region outperforms others in most dimensions of well-being 23
Figure 1.5. Progress towards the Sustainable Development Goals (SDGs): Prosperity .................... 24
Figure 1.6. Global patterns suggest that the large disparities between Thailand’s regions pose a
significant challenge to the transition to a high-income economy ............................................... 26
Figure 1.7. Progress towards the Sustainable Development Goals (SDGs): Partnerships ................. 28
Figure 1.8. Progress towards the Sustainable Development Goals (SDGs): Planet ............................ 30
Figure 1.9. Progress towards the Sustainable Development Goals (SDGs): Peace ............................ 32
Figure 1.10. Thailand’s four transversal challenges .......................................................................... 34
Figure 1.11. Poor regions have grown faster than richer ones, displaying potential for convergence .. 35
Figure 1.12. Intermediary cities are attracting more people .............................................................. 38
Figure 1.13. There is significant variation in educated workers across regions ................................ 39
Figure 1.14. Transfers and tax sharing dominate local administration revenues .............................. 41
Figure 1.15. Annual average damage from flood events as a share of GDP ................................................................. 42
Figure 2.1. The agricultural and manufacturing sectors contribute one-third of regional GDP .................................................. 47
Figure 2.2. Northern provinces have been growing fast ........................................................................................................ 48
Figure 2.3. An action plan to unlock the potential of Northern provinces .................................................................................. 50
Figure 2.4. A four-step approach to designing and implementing innovative regional development strategies ........................................................................................................ 51
Figure 2.5. The definition of homogeneous clusters of provinces should help regional development strategies to adapt to within-region diversities ........................................................................................................ 56
Figure 2.6. Measuring the performance of the Christian Doppler Labs .......................................................................................... 71
Figure 3.1. Empowerment of local actors, evidence-based decision making and appropriate infrastructure solutions are the pillars of a risk management approach to water security .................................................. 83
Annex Figure 2.A.1. The configuration of Max-p regions does not change significantly as the population threshold decreases ........................................................................................................ 77

Boxes

Box 2.1. The Governmental Learning methodology and workshops ......................................................................................... 46
Box 2.2. The impact of innovative regional development strategies in Peru: Smart specialisation and the Forestry “Mesa Ejecutiva” ........................................................................................................ 53
Box 2.3. An innovative methodology to define provincial clusters in Thailand ............................................................................... 57
Box 2.4. Spatial data to improve property tax collection in India ..................................................................................................... 59
Box 2.5. Data-driven approaches to equalising fiscal capacity and spending needs across regions:
   The cases of Italy and Japan ........................................................................................................................................ 61
Box 2.6. Performance-based grants in Italy .................................................................................................................................. 62
Box 2.7. The FUA methodology ............................................................................................................................................... 63
Box 2.8. The Christian Doppler Research Association, Austria: A role model for university-business co-operation in OECD countries ........................................................................................................... 70
Box 3.1. National Policy Dialogues as a process ......................................................................................................................... 85
Box 4.1. Computation of the 2037 objectives in the scorecard ........................................................................................................ 96
Follow OECD Publications on:

- [Twitter](http://twitter.com/OECD_Pubs)
- [Facebook](http://www.facebook.com/OECDPublications)
- [LinkedIn](http://www.linkedin.com/groups/OECD-Publications-4645871)
- [YouTube](http://www.youtube.com/oecdlibrary)
- [OECD](http://www.oecd.org/oecddirect/)

This book has...

[StatLinks](http://dx.doi.org) at the bottom of the tables or graphs in this book. To download the matching Excel® spreadsheet, just type the link into your Internet browser, starting with the [http://dx.doi.org](http://dx.doi.org) prefix, or click on the link from the e-book edition.
**Acronyms and abbreviations**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>12th Plan</strong></td>
<td>Twelfth National Economic and Social Development Plan</td>
</tr>
<tr>
<td><strong>ASEAN</strong></td>
<td>Association of Southeast Asian Nations</td>
</tr>
<tr>
<td><strong>BMA</strong></td>
<td>Bangkok Metropolitan Administration</td>
</tr>
<tr>
<td><strong>BOI</strong></td>
<td>Board of Investments</td>
</tr>
<tr>
<td><strong>CAGR</strong></td>
<td>Compound Average Growth Rate</td>
</tr>
<tr>
<td><strong>EIA</strong></td>
<td>Environmental Impact Assessment</td>
</tr>
<tr>
<td><strong>EU</strong></td>
<td>The European Union</td>
</tr>
<tr>
<td><strong>EUWI</strong></td>
<td>European Union Water Initiative</td>
</tr>
<tr>
<td><strong>FUA</strong></td>
<td>Functional Urban Areas</td>
</tr>
<tr>
<td><strong>GDP</strong></td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td><strong>GHSL</strong></td>
<td>Global Human Settlement Layer</td>
</tr>
<tr>
<td><strong>GIS</strong></td>
<td>Geo-Informatics and Space</td>
</tr>
<tr>
<td><strong>GPP</strong></td>
<td>Gross Provincial Product</td>
</tr>
<tr>
<td><strong>GVC</strong></td>
<td>Global value chain</td>
</tr>
<tr>
<td><strong>ISIC</strong></td>
<td>International Standard Industrial Classification</td>
</tr>
<tr>
<td><strong>IWRM</strong></td>
<td>Integrated Water Resources Management</td>
</tr>
<tr>
<td><strong>LAO</strong></td>
<td>Local Administrative Organisation</td>
</tr>
<tr>
<td><strong>LTA</strong></td>
<td>Land Transport Authority</td>
</tr>
<tr>
<td><strong>MDCR</strong></td>
<td>Multi-dimensional Country Review</td>
</tr>
<tr>
<td><strong>NESDC</strong></td>
<td>National Economic and Social Development Council</td>
</tr>
<tr>
<td><strong>NESDP</strong></td>
<td>National Economic and Social Development Plan</td>
</tr>
<tr>
<td><strong>NPD</strong></td>
<td>National Policy Dialogue</td>
</tr>
<tr>
<td><strong>NSO</strong></td>
<td>National Statistical Office</td>
</tr>
<tr>
<td><strong>NWRC</strong></td>
<td>National Water Resources Committee</td>
</tr>
<tr>
<td><strong>OECD</strong></td>
<td>Organisation for Economic Co-operation and Development</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>PPP</td>
<td>Purchasing power parity</td>
</tr>
<tr>
<td>RCA</td>
<td>Revealed Comparative Advantage</td>
</tr>
<tr>
<td>SDGs</td>
<td>Sustainable Development Goals</td>
</tr>
<tr>
<td>THB</td>
<td>Thai Baht</td>
</tr>
<tr>
<td>TVET</td>
<td>Technical and Vocational Education and Training</td>
</tr>
<tr>
<td>UNECE</td>
<td>United Nations Economic Commission for Europe</td>
</tr>
<tr>
<td>VA</td>
<td>Value added</td>
</tr>
</tbody>
</table>
Executive summary

Thailand has made impressive progress over the past decades, but needs a new model of growth to move forward and achieve its development objectives. On the one hand, strong growth enabled the country to join the group of upper middle-income economies in the early 2010s and to perform well in many areas. Poverty has plummeted and well-being improved considerably, notably with respect to health and education. On the other hand, few regions have fully benefited from growth and economic development has taken a toll on the environment. According to Volumes 1 and 2 of the Multi-dimensional Review of Thailand, the country needs to tackle regional inequality, improve multi-level governance and better manage water resources and disaster risk in order to achieve more inclusive and sustainable economic growth.

This volume of the Multi-dimensional Country Review (MDCR) builds on the results of the second phase of the MDCR and provides concrete actions for policy implementation. These actions could help achieve the three transitions that the country needs to move to the new level of development: moving towards a more regionally balanced growth path, simplifying multi-level governance and improving the management of water resources and disaster risk. The report moreover provides a scorecard for tracking policy implementation. To make actions as concrete as possible, the Action Plan focuses on the North of Thailand, one of the fastest growing, most diverse and yet poorest regions of the country.

The Action Plan is the result of a policy dialogue that mobilised key stakeholders from the North. Participants to workshops in Chiang Rai and Chiang Mai prioritised issues and proposed actions to operationalise recommendations of the earlier MDCR reports.

Creating successful strategies is a process of trial and error that requires the collaboration of many players. The following actions should thus be read as a guide to such a process. The scorecard in Chapter 4 of this report proposes a set of indicators for measurement of performance throughout the process. In combination this action plan and the scorecard can thus help to transform the North of Thailand into a “Policy Lab” where innovative actions and ideas for regional development can be tested.

Developing the potential of Thailand’s North

In spite of remarkable growth rates, the North of Thailand remains one of the less developed and most unequal regions of the country. Certain provinces and areas are transforming into thriving hubs for manufacturing, logistics (connectivity with the Greater Mekong Subregion) and tourism services, while others lag behind and rely on rural activities with low productivity.

Several capabilities are key for the Northern Region: creating an effective strategy and having strong LAOs to support it, Metropolitan areas that drive the region’s development, and universities and colleges that act as key drivers of development.
Three conditions are key to getting regional development strategies right: 1) placing local innovation and discovery in the driver’s seat 2) a strong focus on performance and 3) coordination to ensure coherence of plans and policies.

“Smart Labs” are proposed here for a strategy creation process. They build on sound data analysis and bring together private and public agents to identify and agree on the key development opportunities of a province or a group of provinces. The purpose of Smart Labs is threefold. First, the knowledge and views of participants complement the results of the data analysis, which may not capture local cultural nuances and specificities driving local comparative advantage. Second, they provide participants with an opportunity to agree on the bottlenecks that the central and local government need to remove to unleash the potential of comparatively advantageous sectors. Lastly, the Smart Labs are a crucial step to ensure that all stakeholders in charge of the implementation of regional development strategies are actually involved in the planning process.

To be effective and coherent, smart regional strategies need to account for the diverse ambitions, contexts and assets within the North. Data analysis can help identify optimal provincial clusters, allowing new regional development strategies to leverage on local stakeholders’ capacities and targeting areas with common potential and challenges.

Once a deep strategy is created, implementation requires the effective empowerment of Local Administrative Organisations (LAOs) and their fiscal autonomy. Based on workshop participants’ insights, the Action Plan proposes to increase LAOs’ own share of revenues, especially by strengthening the tax base for the building and land tax. LAOs should allocate more resources to continuous training and peer learning among local administrators, in order to build local fiscal capacity. Moreover, the intergovernmental grant system needs a new design.

Northern cities may play a pivotal role and become key drivers of regional development and innovation. To be effective, urban policies need to be well-targeted and accountable. Local authorities could define functional urban areas, which are based not only on the residents, but also on the actual urban users – such as, residents of the hinterland commuting daily to the core urban centres for work-related or education purposes. Metropolitan authorities with directly elected mayors could help improving accountability of decisions taken in the newly-defined functional urban areas. To further strengthen accountability, northern cities could experiment participatory budgeting and other forms of participation of voters to local budgeting.

The sustainable development of cities and their surroundings depends also on the infrastructure connecting urban with rural areas. Local and provincial governments need to create transport authorities for every functional urban area. They could moreover rely on traditional surveys and big data to benchmark the quality of urban infrastructure, and to assess current and future needs.

Finally, local universities are an essential catalyst of innovation if they promote entrepreneurship education and support existing entrepreneurs. Following best practices from OECD countries, the Action Plan proposes that Northern universities integrate technical education with entrepreneurship education, enjoy more incentives and space for autonomous initiative, create a network to support start-ups, and explore partnerships with local enterprises.
Improving the management of water security in the North

In order to improve the management of water security, the North needs a national strategy that sets the vision and guiding principles for the water sector, and empower local and provincial actors. The strategy should lay down the framework that regional and local actors would use to develop capacity, exploit local knowledge, better prioritise and implement action. While designing the strategy, authorities should scan the current governance, and identify gaps and overlaps with regard to policy, objectives, information and capacity. This review would facilitate the development and optimisation of an action plan.

Robust evidence should drive the design of the strategy and its implementation. In this regard, Thailand should abandon the current decentralised and fragmented data collection with limited exchange between agencies. Relevant agencies and ministries should centralise key information on access and provision of water, quality, and impact of floods and droughts with the full collaboration of local administrators. Using data to prioritise action would facilitate the identification of the level of risk and priorities at the national and local levels. A revised list of policy tools, deployed to achieve national and regional objectives, should go hand-in-hand with the creation of this data catalogue.

A robust financial plan should accompany the national strategy to provide the North with appropriate and realistic infrastructure investments. While the national strategy maps infrastructural gaps, the robust assessment of long-term capital, operation and maintenance budget helps prioritise the infrastructural policies that can answer to local needs realistically and effectively.
Chapter 1. Synthesis of multi-dimensional analysis: New capabilities for Thailand

Thailand is a fast-emerging country that aspires to become a high-income economy by 2037. Strong growth since the 1970s enabled the country to join the group of upper middle-income economies in the early 2010s. At the same time, the benefits of prosperity have not been shared evenly nationwide and economic development has taken a toll on the environment. Moving forward, Thailand needs to achieve faster but also more inclusive and sustainable economic growth. This chapter provides a synthesis of the constraints analysis across the five critical areas of the Sustainable Development Goals – people, prosperity, partnerships, planet and peace. This is followed by an in-depth analysis of the three main transitions Thailand faces going forward: enabling new growth by unlocking the full potential of each region, developing more effective methods of organisation and collaboration between actors and levels of government, and managing water security and disaster risk.
Thailand is striving to realise an ambitious long-term development vision. Strong growth since the 1970s enabled the country to join the group of upper middle-income economies in the early 2010s and has seen Thailand perform well in many areas. Poverty has plummeted and well-being has improved considerably, notably with respect to health and education. At the same time, economic development has taken a toll on the environment and the benefits of prosperity have not been shared evenly nationwide. Moving forward, Thailand needs to achieve faster but also more inclusive and sustainable economic growth. Getting there will require making the most of every region and developing more effective forms of organisation and collaboration between actors and levels of government.

The Multi-dimensional Country Review (MDCR) is being undertaken to support Thailand in achieving its development objectives. It consists of three phases and reports. This third volume provides a synthesis of the analyses and policy recommendations provided in previous volumes – the Initial Assessment (OECD, 2018[1]) and In-depth Analysis and Recommendations (OECD, 2017[2]) – and provides a concrete set of actions and a scorecard of indicators (Figure 1.1).

Figure 1.1. Multi-dimensional Review of Thailand – Process

Boosting regional development will need to be a cornerstone of Thailand’s future development strategy. The action plan presented in this volume focuses on the North of Thailand, one of the fastest growing, most diverse and yet the second poorest region of the country.

Stakeholders in the north determined priorities and several of the proposed actions using a “governmental learning spiral” approach – a technique for learning in complex political environments. Participants at two policy dialogue events, held in Chiang Rai and Chiang Mai, worked through the findings and recommendations of the earlier MCDR reports. The purpose of the policy dialogue was to transfer the knowledge embodied in these reports to local actors as a first step towards implementation. These pioneering actions would enable the North to become a “Policy Lab”, setting an example for Thailand’s
other regions to embrace structural transformation, more efficient governance and environmental sustainability.

This chapter provides a synthesis of the preceding volumes Initial Assessment and In-depth Analysis and Recommendations. It retraces the constraints analysis based on the Sustainable Development Goals (SDGs) and the OECD well-being framework and the resulting focus on unlocking the potential of regions, water security and more effective multi-level governance. Chapter 2 contains the action plans for developing the full potential of the North, and Chapter 3 presents the action plan for better managing water resources in the North. The final chapter includes the scorecard proposed for measuring progress.

**Initial Assessment: Thailand’s aspirations and key constraints to development**

Thailand aspires to become a high-income economy by 2037 enjoying “security, prosperity and sustainability” based on its sufficiency-economy philosophy (2017 National Strategy Preparation Act). The National Strategy sets out five broad objectives in this regard: (i) economic prosperity – to create a strong and competitive economy driven by innovation, technology and creativity; (ii) social well-being – to create an inclusive society that progresses without leaving anyone behind by realising the full potential of all members of society; (iii) human resource development and empowerment – to transform Thai citizens into “competent human beings in the 21st century” and “Thais 4.0 in the first world”; (iv) environmental protection – to become a liveable, low-carbon society with an economic system capable of adjusting to climate change; and (v) public sector governance – to improve public sector administration and reduce corruption.

The Initial Assessment of Thailand (OECD, 2018) focused on existing constraints and capabilities related to these ambitions. The assessment applied the OECD’s well-being framework and was structured in accordance with the UN’s Agenda 2030 and its 17 SDGs, which are divided into five categories: People, Prosperity, Planet, Peace and Institutions, and Partnerships and Financing. For each category the assessment evaluated achievements and current policy and identified key constraints that hinder Thailand’s progress. The constraints analysis identified 20 constraints (about four per P) which point to four cross-cutting challenges that Thailand needs to address in order to achieve its goals.

The assessment distinguished three key transitions: unlocking the potential of Thailand’s regions, better multi-level governance and water security. These became the focus of the subsequent in-depth analysis and policy recommendations.

**Well-being: Thailand offers a good quality of life for many, but work, skills and the environment present challenges**

The OECD’s “How’s Life?” index, which benchmarks well-being, indicates that Thailand performs well on several dimensions of quality, particularly housing and social connections, but lags behind on skills, informality and the environment. Well-being relates to material conditions (e.g. income, jobs and housing) but also encompasses the broader quality of people’s lives including their health, education, environment, social connections and subjective well-being (OECD, 2017; Boarini, Kolev and McGregor, 2014). Performance is especially strong with respect to life evaluation, social connections, security, and housing and infrastructure. The picture is more mixed when it
comes to other dimensions, such as the environment, education and skills, or work. For instance, while levels of unemployment are very low, working conditions are worse than might be expected given Thailand’s level of development (Figure 1.2).

**Figure 1.2. Current and expected well-being outcomes for Thailand: Worldwide comparison**

![Figure 1.2. Current and expected well-being outcomes for Thailand: Worldwide comparison](image)

*Note:* The bars represent the observed well-being values for Thailand and the black circle shows the expected values based on Thailand’s level of GDP per capita. The latter stem from a set of bivariate regressions with GDP as the predictor and the various well-being outcomes as dependent variables from a cross-country dataset of around 150 countries with a population of over a million. All indicators are normalised in terms of standard deviations across the panel. The observed values falling inside the black circle indicate areas where Thailand performs poorly in terms of what might be expected from a country with a similar level of GDP per capita. As this figure only shows outcomes at the national level, disparities between regions might be masked.

*Source:* (OECD, 2018[1]).

**The five pillars of Agenda 2030: Thailand has showed impressive performance, the remaining constraints point to the need for further transitions**

Thailand generally performs well across the five pillars of the Agenda 2030, but further progress towards a more inclusive and sustainable economy is needed. Overall, benchmarking past performance against SDG targets attests to Thailand’s impressive performance, particularly on outcomes related to people and prosperity. Progress in poverty reduction and boosts to innovation and electricity infrastructure are especially
notable. At the same time, the underlying structure of the labour market has hardly changed and about half of the working population continues to work informally with limited access to protection and services. Major environmental challenges remain as well, notably with respect to emissions and pollution (OECD, 2018[1]).

People

The People pillar of the 2030 Agenda for Sustainable Development focuses on quality of life in all its dimensions, and emphasises the international community’s commitment to ensuring all human beings can fulfil their potential in dignity, equality and good health.

Table 1.1. People – four major constraints

<table>
<thead>
<tr>
<th>Constraint</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Informality remains widespread and informal workers are not well covered by the social protection system.</td>
<td></td>
</tr>
<tr>
<td>2. Pension arrangements do not prevent old-age poverty and will become even more inadequate as the population ages.</td>
<td></td>
</tr>
<tr>
<td>3. Basic education outcomes fall short of global benchmarks.</td>
<td></td>
</tr>
<tr>
<td>4. Tertiary and vocational education does not adequately equip students with the necessary skills required by industry.</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1.3. Progress towards the Sustainable Development Goals (SDGs): People

Note: The bars measure Thailand’s performance in 2000 and 2016 (or latest year – as indicated accordingly) for a selection of 26 indicators across the 17 Sustainable Development Goals (SDGs). Indicators are chosen in line with the UN global framework and to ensure measurability. The 2030 aspirational target values refer to the pre-defined UN target (established by the UN IAEG and available at: https://unstats.un.org/sdgs/iaeg-sdgs/metadata-compilation/). Targets are all normalised to 100 for representation and comparison purposes.

a. When UN 2030 targets were not quantifiable, targets were calibrated to the average performance of OECD countries, in accordance with the methodology outlined in a recent OECD study on measuring distance to the SDGs targets (OECD, 2017[4]). However, the target for “Total debt service” was calibrated to the average value of the top 3 performers in the ASEAN region, due to data unavailability in OECD countries.

Source: (OECD, 2018[1]).
Over recent decades, economic success has brought impressive social progress. Poverty has plummeted from 60% in 1990 to 7% today measured against the national poverty line (2% at international USD 3.1 per day; Figure 1.3), while social services in education and health have expanded considerably and improved. The introduction of the Universal Health Coverage Scheme in 2002 represented a major step towards basic social protection for all, including those living in informal circumstances, and was complemented by the introduction of a universal monthly old-age allowance for the elderly in 2009.

However, as transformation slowed, social and spatial imbalances came to the fore. The share of those in precarious employment stagnated at around half of the working population following the mid-2000s (Figure 1.5), after falling from 70% in the late 1980s, when records started. This reflects the high share of poor agricultural workers in rural areas and significant urban informality. The creation of new activities replacing low-productivity employment has slowed down and the skills required for modern urban jobs exceed those of rural migrants and the urban poor. Today, only 11% of Thai citizens say that they can live comfortably with their current income (Gallup, 2017[5]).

Going forward, more efforts are needed to reduce still widespread informality and persistent, substantial regional inequalities, and to further improve living standards, especially for those who currently work informally.

Inequality in Thailand has a strong regional dimension. Inhabitants of the poorer North, Northeast and Southern regions lag behind the more prosperous Bangkok and Central regions, both in terms of income and other dimensions of well-being such as employment conditions, education attainment, health outcomes, and transport and communication infrastructure (Figure 1.4). Mainstreaming equality considerations into the policy formulation process and directing efforts towards narrowing Thailand’s regional gaps, as recognised in the 12th Plan, is likely to improve social cohesion.

Informality remains widespread and informal workers are not well covered by the social protection system. Although the official unemployment rate is exceptionally low, the majority of workers (about 55%) remain in informal occupations and are more likely to be exposed to unstable contractual situations, long hours and hazardous working conditions. Moreover, unemployment insurance is only available to employees in the formal sector and hence informal workers are exposed to greater risk. This is particularly relevant for the 3.5 million migrant workers in Thailand. The relatively strict labour protections, particularly individual dismissal and temporary employment regulations, may contribute to informal employment. However, informality has many other drivers, including tax and social security (dis)incentives to formalise labour, rigid wage structures, low worker productivity and the overall structure of the economy.

Social protection needs to be broadened, notably for informal workers and the elderly. The gradual evolution of Thailand’s social security schemes has resulted in a relatively comprehensive but fragmented system, calling for simplification and harmonisation of programmes. Benefit eligibility is largely tied to employment status, with different programmes for civil servants, people holding formal jobs and informal workers. A universal old-age allowance supports informal workers without pension coverage, but the adequacy of benefits can be improved to prevent old-age poverty. The recent addition of means-tested benefits that target people below a certain income threshold, such as a child grant and a welfare card for low-income earners, is an encouraging step towards reducing inequality.
Figure 1.4. The Bangkok metropolitan region outperforms others in most dimensions of well-being

Achievement scores from 0 (worst) to 1 (best), 2017

Note: The Human Achievement Index is a composite index that compares regional performance with achievement scores that use the worst and best performance observed in the provinces. These scores are calculated for a range of indicators for relevant sub-indices (e.g. for employees covered by social security, occupational injuries, unemployment and underemployment rates in the case of the employment sub-index). For the purpose of this report, only the scores for the sub-indices of income, employment, education, health, transport and communication, and housing and living conditions are shown, since their underlying indicators come closest to the SDGs. The Central region as shown here excludes the Bangkok Metropolitan Area.
Source: (NESDC, 2017[6]).

Improving basic education quality and performance will be essential. At around 4% of gross domestic product (GDP), Thailand’s public expenditure on education is among the highest in the region. However, basic education performance falls short of global benchmarks (Figure 1.2). Inefficient and inequitable allocation of resources has undermined investment effectiveness and ultimately hampered learning outcomes. The 2015 results of the OECD Programme for International Student Assessment (PISA) show that the performance of Thai students trails most comparator countries and is far below the OECD average. Moreover, compared with PISA 2012, Thailand’s scores declined significantly in science and reading. Reading performance is particularly worrisome, with only around half of Thailand’s 15 year-olds demonstrating reading skills that would classify them as functionally literate. On one estimate, around one-fifth of Thai schools do not meet minimum quality standards, the majority of which are in rural areas (OECD, 2013[7]).

Tertiary and vocational education does not adequately equip students with the necessary skills required by industry. Upgrading human capital is crucial for the success of Thailand 4.0 and managing the transition to an ageing society (OECD, 2018[11]). In tertiary education, enrolment is comparatively high, but the quality and relevance of university programmes needs to be raised. Technical and vocational education does not attract enough students, even though skills shortages are more acute for graduates with vocational training. In 2015, only 34% of upper secondary school students were enrolled in vocational programmes – down from 36% in 2011 and well below the government’s 45-55% target (MOE, 2017[8]). Moreover, the quality of training programmes needs improvement to better equip graduates with the skills needed by industry.
Prosperity

The Prosperity pillar of the 2030 Agenda for Sustainable Development calls for policies that bring together structural transformation with a fair distribution of the growth dividend. To achieve this twofold objective, Thailand needs to improve human resource development, encourage technology diffusion, promote innovation and digitalisation, improve the SME policy framework and expand regional integration. Innovative regional policies will ensure prosperity spreads throughout the regions.

Table 1.2. Prosperity – four major constraints

<table>
<thead>
<tr>
<th>Constraint</th>
<th>2000</th>
<th>2016 (or latest available)</th>
<th>2030 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Slow economic transformation within sectors and across regions holds back productivity growth.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Low innovation and research with limited commercialisation potential adversely affect competitiveness and productivity.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. SME access to financing is costly and constrains development.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Some cross-border barriers to services trade and investment remain significant, notwithstanding ongoing liberalisation in the context of ASEAN.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1.5. Progress towards the Sustainable Development Goals (SDGs): Prosperity

Note: The bars measure Thailand’s performance in 2000 and 2016 (or latest year – as indicated accordingly) for a selection of 26 indicators across the 17 Sustainable Development Goals (SDGs). Indicators are chosen in line with the UN global framework and to ensure measurability. The 2030 aspirational target values refer to the pre-defined UN target (established by the UN IAEG and available at: https://unstats.un.org/sdgs/iaeg-sdgs/metadata-compilation/). Targets are all normalised to 100 for representation and comparison purposes. a. When UN 2030 targets were not quantifiable, targets were calibrated to the average performance of OECD countries, in accordance with the methodology outlined in a recent OECD study on measuring distance to the SDGs targets (OECD, 2017[4]). However, the target for “Total debt service” was calibrated to the average value of the top 3 performers in the ASEAN region, due to data unavailability in OECD countries.

Source: (OECD, 2018[1]).
Slow economic transformation holds back productivity growth. To attain high-income country status, Thailand’s economic growth needs to be driven by productivity gains, rather than by the sheer accumulation of capital and labour inputs. Accordingly, Thailand’s 12th Plan and Thailand 4.0 are pursuing an economic transformation where productivity improvements result from increases in innovation, human capital development, regulatory reform and infrastructure development drive growth. Traditionally, labour reallocation from the agricultural sector in rural areas to more advanced sectors in urban areas supports productivity improvements and is a key feature of catch-up growth and structural transformation. However, over the past 30 years, the contribution of labour reallocation to overall labour productivity growth has declined in Thailand.

To foster the development of more productive and higher value-added industries, the government aims to improve industrial value chains by strengthening linkages among firms, researchers and academic institutions, and public organisations within a geographical area. In particular, the government is targeting a set of priority sectors selected from those that have recorded strong export performance. The sectors consist of “First S-Curve” industries where the industrial base of pre-existing sectors would be upgraded (e.g. next-generation automotive, smart electronics, agriculture and biotechnology, and affluent medical and wellness tourism), and “New S-Curve” industries that can be developed through increased technological sophistication (e.g. robotics, aviation and logistics, biofuels and biochemicals, and digital and medical hubs). To this end, the government has launched a range of investment promotion measures and incentives in designated Special Economic Zones, which include the flagship Eastern Economic Corridor project.

Large disparities between Thailand’s regions pose a significant obstacle to growth and structural transformation. The differences in per capita income between the poorest and richest regions of Thailand can be compared to the difference between Zambia and Poland (Figure 1.6, Panel A). Regional inequality may undermine growth. Only one other country (the Russian Federation) for which comparable data are available has reached a higher level of GDP per capita with a level of regional inequality as high as that of Thailand (Figure 1.6, Panel B). At such levels, workers and investments risk oversaturating labour and capital markets in already advanced areas; at the same time, poorer regions increasingly risk being left behind because of unfulfilled potential.

Yet, regional and provincial growth patterns suggest that much potential remains untapped outside the current centres. Although their levels are lower, the poorer regions of Thailand have shown consistently higher growth than Bangkok in both production and productivity since the beginning of the 2000s (Figure 1.11). The “catching-up” process has begun in some areas and has the potential to become a significant driver of further transformation if well supported. This calls for a dedicated approach to the development of all of Thailand’s regions.

Low innovation and research with limited commercialisation potential adversely affect competitiveness and productivity. Improving innovation in existing sectors is critical to boosting competitiveness and productivity, and to producing higher value-added products. However, Thailand’s innovation performance has either fallen behind or lost ground vis-à-vis some comparator East Asian countries. Governance issues including poor co-ordination and lack of clarity around institutional roles and responsibilities have hindered innovation. To address these issues, the government established the National Research and Innovation Policy Council in late 2016 as a single body to set the direction for research and innovation policy.
SME access to financing is costly and constrains development. Small and medium enterprises (SMEs) generate about 42% of Thailand’s GDP, mostly in services. Promoting SMEs is crucial for economy-wide growth and reducing inequality between regions and individuals (Lee, Narjoko and Oum, 2017[9]). SMEs face a number of interrelated problems including inadequate financing, insufficient upgrading of capital stock and slower adoption of technology, as well as inadequate regional integration (Charoenrat, 2017[10]). The government has developed an SME Promotion Masterplan (2017-21) with the objective of increasing the SME share in GDP to at least 50% by 2021. Its priorities include streamlining licensing procedures, promoting skills training with an emphasis on ICT, and providing entrepreneurship education and finance.

Figure 1.6. Global patterns suggest that the large disparities between Thailand’s regions pose a significant challenge to the transition to a high-income economy

Panel A. GDP per capita across Thailand is so diverse that different regions can be compared to countries at all stages of development

Panel B. High regional disparity is an obstacle to growth

Note: The Gini index measures the degree of inter-regional inequalities. An index equal to 0 implies no inequality – all resources are equally redistributed across the country. An index equal to 1 implies extreme inequality – all resources are concentrated in only one region. The analysis is based on OECD regional typology, and in particular on regional inequalities among Territorial Level 2 (TL2) regions. TL2 broadly corresponds to the first tier of subnational government. For comparative purposes, TL2 regions in Thailand correspond to the country’s 77 provinces.

Source: Authors’ calculations based on national accounts, as provided by NESDC and (World Bank, 2017[11]).

StatLink 2 http://dx.doi.org/10.1787/888933949174
Global value chain (GVC) participation and regional integration are progressing, but some cross-border barriers to services trade and investment remain significant. Trade and foreign investment have long been major drivers of Thailand’s industrialisation. Foreign trade amounted to 118% of GDP in 2016, more than double the OECD average, reflecting active participation in GVCs. Making the best of opportunities brought about by participation in GVCs calls for efficient and cheap access to imported intermediate and capital goods. In this regard, Thailand has made substantial progress, almost halving the weighted applied mean tariff rate for manufacturing goods over the past decade. Trade liberalisation and facilitation has lagged somewhat in the services sector, which accounts for close to 60% of GDP in Thailand, but is key to productivity and competitiveness. Open and well-regulated services markets are the gateway to GVCs, ensuring access to information, skills and technology, reducing costs and improving service quality (OECD, 2017[12]). This is true in particular for digital, logistics and professional services used in high value-added activities. However, a pilot project to compute the OECD Services Trade Restrictiveness Index for Thailand shows that the country’s regulatory framework creates international trade impediments in both the construction and architecture service sectors.

**Partnerships**

The Partnerships pillar of the 2030 Agenda for Sustainable Development cuts across all goals focusing on the mobilisation of resources needed to implement the agenda. Thailand’s “sufficiency economy philosophy” encourages the prioritisation of long-term sustainability over short-term benefits. As such, Thailand has a long history of fiscal prudence that has served the country well in times of economic and political instability. However, the country’s rapidly ageing population and shrinking workforce will exert pressure on public finances over the medium term.

<table>
<thead>
<tr>
<th>Table 1.3. Partnerships and financing – three constraints</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Despite a sound fiscal position, current revenue will not suffice to fund commitments over the medium term. Further improvements to the tax mix are needed to foster growth and competitiveness.</td>
</tr>
<tr>
<td>2. Inefficient infrastructure financing increases costs, emphasising the importance of identifying efficiencies.</td>
</tr>
<tr>
<td>3. The public cost of healthcare and pension systems will grow and become increasingly unaffordable.</td>
</tr>
</tbody>
</table>

Despite a sound fiscal position, current revenue will not suffice to fund commitments over the medium term. Further improvements to the tax mix are needed to foster growth and competitiveness. Over the past five years, Thailand’s total tax collections averaged about 18% of GDP, up from 14% in 2000 (OECD, 2018[11]). This is broadly in line with regional comparators, but much lower than the OECD average and insufficient for investing in Thailand’s ambitions for 2037. Recognising the need to boost revenues, the government has set a target of raising total tax collection to 20% of GDP by 2020. To broaden the tax base, Thailand should consider gradually widening the VAT scope and raising its rate, using additional revenues to fund targeted increases in social protection.
Identifying potential efficiencies in the provision of public infrastructure will also be important to reduce the public expenditure burden. Thailand could consider additional infrastructure financing sources to reduce the costs of investment and optimise risk allocation. In particular, infrastructure bonds priced in Thai baht can be less costly than bank financing and better match the long-term nature of such investments. Another way forward is to reinvigorate private sector involvement through improved public-private partnership (PPP) processes. In this regard, the government has sought to reduce red tape and improve bureaucratic efficiency, reforming PPP legislation in 2013 with the introduction of time limits and standardised contracts. Furthermore, Thailand has set up a Future Fund to provide additional instruments to finance major transportation infrastructure.

The public cost of healthcare and pension systems will grow and become increasingly unaffordable. In relation to pensions, Thailand’s shrinking labour force and longer retirements mean that there are fewer work years available to support the burgeoning number of retirees. Thailand’s private pension scheme has a pensionable age of 55, while the public sector scheme and the social pension both have a pensionable age of 60. OECD research suggests that postponing retirement is an efficient way to both boost retirement income and improve the financial sustainability of the system (OECD, 2013[13]). Thailand could align the pensionable age of the private pension scheme with the public sector and social pension scheme, and progressively increase the official retirement age in line with life expectancy. Moreover, the government could slowly increase the private sector contribution rate, which is currently below most comparator countries and the OECD average.

Note: The bars measure Thailand’s performance in 2000 and 2016 (or latest year – as indicated accordingly) for a selection of 26 indicators across the 17 Sustainable Development Goals (SDGs). Indicators are chosen in line with the UN global framework and to ensure measurability. The 2030 aspirational target values refer to the pre-defined UN target (established by the UN IAEG and available at: https://unstats.un.org/sdgs/iaeg-sdgs/metadata-compilation/). Targets are all normalised to 100 for representation and comparison purposes.

a. When UN 2030 targets were not quantifiable, targets were calibrated to the average performance of OECD countries, in accordance with the methodology outlined in a recent OECD study on measuring distance to the SDGs targets (OECD, 2017[4]). However, the target for “Total debt service” was calibrated to the average value of the top 3 performers in the ASEAN region, due to data unavailability in OECD countries.

Source: (OECD, 2018[1]).
Planet

The Planet pillar of the 2030 Agenda for Sustainable Development covers six environmental areas: water, clean energy, responsible production and consumption, climate action, life below water and life on land.

Thailand’s natural environment is a vital asset and underpins key economic sectors and millions of livelihoods. As in many emerging economies, rapid economic growth has been achieved through intense use of natural resources, which has exerted a heavy environmental toll. Greater attention to environmental issues began in the 1990s, and resulted in the adoption of a framework law that established the Ministry of Natural Resources and the Environment, and introduced instruments such as Environmental Impact Assessments. Today, renewed commitment to environmental concerns is warranted, as progress on this front has slowed or even reversed in some cases. Thailand’s sustainable development rests on wise management of its natural resources, minimisation of pollution to protect the health of people and ecosystems, and a transition to a low-carbon, climate-resilient future.

Table 1.4. Planet – five constraints

<table>
<thead>
<tr>
<th>Constraint</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Highly fragmented water management is leading to overlapping responsibilities, conflicting interests and a lack of co-ordination.</td>
</tr>
<tr>
<td>2. The repeated pattern of floods and droughts causes loss of life and economic disruption.</td>
</tr>
<tr>
<td>3. Environmental quality of life is undermined by insufficient progress on air and water pollution, and waste generation.</td>
</tr>
<tr>
<td>4. Current power sector plans may lock Thailand into a more carbon-intensive path.</td>
</tr>
<tr>
<td>5. The governance framework does not sufficiently integrate environmental concerns into public plans and policies.</td>
</tr>
</tbody>
</table>

Thailand is exposed to cycles of flooding and drought that cause loss of life and economic disruption. While natural climatic variables are important drivers of these phenomena, other policy-amenable factors are also at play. Poorly planned urban expansion, the intensification of agriculture, and the deterioration or loss of watershed forests have led to the decline of flood-retention areas and flood plains, while water consumption behaviours, agricultural and industrial land development, urbanisation and population growth have contributed to droughts.

Water management in Thailand is characterised by a highly fragmented institutional framework leading to overlapping responsibilities, conflicting interests and a lack of co-ordination. The government has also tended to focus on hard infrastructure and supply-side solutions, while demand-side measures have received less attention. Thailand would benefit from a more holistic approach to water management and flood defence, complemented by a disaster risk management approach that is sufficiently funded and ensures that local levels have the capacity to prepare and respond to natural disasters.

Challenges remain in securing environmental quality of life, particularly with regard to air pollution and water and waste generation. Levels of some air pollutants, such as PM2.5 particles, have been creeping up since 2010, after modest improvement in the years after 1990. The problem is particularly acute in pollution hotspots such as the country’s major industrial zones, where air pollution frequently exceeds safe limits. Water quality has been improving incrementally, but 23% of surface water is still assessed as poor quality. Greater progress is being held back by a lack of wastewater treatment facilities (only 15% of municipal wastewater is treated), poor compliance with existing regulations and the absence of financial disincentives to pollute. Finally, solid waste generation is a growing problem, as is the case in many countries in the region. The
A quantity of solid waste has increased by 80% since 2000, and 43% of waste is disposed of inappropriately through open burning or illegal dumping. The composition of waste, however, shows a high potential for reuse: up to 60% could be composted, recycled or used for energy generation. Appropriate pricing mechanisms are also needed to provide incentives to reduce the absolute quantity of waste generated.

Figure 1.8. Progress towards the Sustainable Development Goals (SDGs): Planet

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2000</th>
<th>2016 (or latest available)</th>
<th>2030 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved water source (% of population with access)</td>
<td>9</td>
<td>93 (2015)</td>
<td>100</td>
</tr>
<tr>
<td>Renewable energy consumption (% of total final energy consumption)</td>
<td>22</td>
<td>24 (2014)</td>
<td>47</td>
</tr>
<tr>
<td>PM2.5 air pollution, mean annual exposure (micrograms per cubic meter)</td>
<td>24</td>
<td>26 (2015)</td>
<td>10</td>
</tr>
<tr>
<td>CO₂ emissions (kg per 2010 USD of GDP)</td>
<td>0.83</td>
<td>0.83 (2014)</td>
<td>0.26</td>
</tr>
<tr>
<td>Marine protected areas (% of territorial waters)</td>
<td>4</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>Terrestrial protected areas (% of total land area)</td>
<td>17</td>
<td>19</td>
<td>22</td>
</tr>
</tbody>
</table>

Note: The bars measure Thailand’s performance in 2000 and 2016 (or latest year – as indicated accordingly) for a selection of 26 indicators across the 17 Sustainable Development Goals (SDGs). Indicators are chosen in line with the UN global framework and to ensure measurability. The 2030 aspirational target values refer to the pre-defined UN target (established by the UN IAEG and available at: https://unstats.un.org/sdgs/iaeg-sdgs/metadata-compilation/). Targets are all normalised to 100 for representation and comparison purposes.

a. When UN 2030 targets were not quantifiable, targets were calibrated to the average performance of OECD countries, in accordance with the methodology outlined in a recent OECD study on measuring distance to the SDGs targets (OECD, 2017[4]). However, the target for “Total debt service” was calibrated to the average value of the top 3 performers in the ASEAN region, due to data unavailability in OECD countries.

Source: (OECD, 2018[1]).

The governance framework does not sufficiently integrate environmental concerns into public plans and policies. Thailand has set ambitious greenhouse gas reduction targets – intended to cut emissions by 20-25% from the projected business-as-usual level by 2030 – and has identified energy and transport as key sectors for mitigation efforts. Some features of current energy plans, however, may be inconsistent with international commitments, which are set to become increasingly stringent. In particular, the planned increase in the share of coal in the energy mix will raise the absolute level of carbon emissions. On a positive note, the share of renewables is also slated to rise under current plans. Thailand could be even more ambitious in its adoption of renewables by exploiting untapped potential in the solar photovoltaic sector. It could also consider higher environmental taxation.
As one of the countries most exposed to the impacts of climate change, Thailand’s mitigation efforts need to be complemented by adaptation. In this regard, the 12th Plan and the National Climate Change Master Plan 2015-2050 aim to enhance the country’s ability to adapt to climate change. This is a welcome move as adaptation is largely neglected in current sectoral plans. The true test will be whether these high-level plans translate into awareness, mainstreaming and implementation of adaptation measures across all sectors from national to local levels. Implementation will require effective central co-ordination involving all relevant stakeholders, a strong evidence base (e.g. for climate projections), capacity building (especially at local levels), sufficient financing, and mechanisms for monitoring, evaluating and adjusting approaches.

**Peace**

The Peace and Institutions pillar of the 2030 Agenda for Sustainable Development encompasses a diverse range of issues including peace, stability and trust, as well as effective governance and the performance of the public sector more broadly.

Reforming the public sector is high on the government’s agenda, but involves four main challenges. First, the gap between planning and implementation of policy objectives remains large. Second, insufficient public participation in policy making is undermining the efficient allocation of resources toward public needs and development goals. Third, under-development of evidence-based regulations is hampering the creation of a business-friendly environment essential to high value-added activities. Finally, high levels of perceived corruption are weakening business confidence and public trust in the government.

**Table 1.5. Peace – four constraints**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Institutional capacity to implement reform falls short, including with respect to co-ordination across ministries and agencies.</td>
</tr>
<tr>
<td>2.</td>
<td>Imbalance between central and local governments hinders policy reform.</td>
</tr>
<tr>
<td>3.</td>
<td>Competition legislation has not been adequately enforced.</td>
</tr>
<tr>
<td>4.</td>
<td>Current corruption levels are high and require strong government measures.</td>
</tr>
</tbody>
</table>

Imbalance between central and local governments hinders policy reform. Effective action at the local level is a crucial prerequisite for achieving Thailand’s ambitions; however, the authorities recognise the existence of inefficiencies at regional and local level, and have attempted to rationalise the tasks carried out by each layer of government. In practice, responsibilities over service delivery between central and local administrations often remain unclear, and local authorities lack the human capacity and the tools to improve local well-being. Moreover, the current governance design orient accountability upwards, towards central administrators, rather than downwards, towards citizens. In pursuing further decentralisation Thailand needs to sufficiently equip local authorities in terms of both technical capacity and fiscal resources to deliver on their increased responsibility.

Competition legislation has not been adequately enforced. With the adoption of the 1999 Trade Competition Act, Thailand became one of the first ASEAN countries to introduce competition policy. The Act covers both anti-competitive practices (agreements, abuse of dominant position and mergers) and some forms of restrictive/unfair trade and commercial practices. However, despite nearly a hundred complaints submitted since its enactment, there have been no findings of infringement.

A revised Trade Competition Act was adopted in 2017 against the backdrop of the ASEAN Economic Community Blueprint 2015, which called for harmonised competition
policies. It strengthens alignment with international best practice, including through the introduction of a prior approval merger control regime. Efforts have also been deployed to reform the Trade Competition Commission (TCC) to build a more independent legal institution, with its own budget and staff separated from the Ministry of Commerce.

Figure 1.9. Progress towards the Sustainable Development Goals (SDGs): Peace

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2005</th>
<th>2015</th>
<th>2030 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intentional homicides (per 100,000 people)</td>
<td>3.6</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>% of population who believe that elections are honest</td>
<td>-</td>
<td>57</td>
<td>62</td>
</tr>
<tr>
<td>Corruption perception index</td>
<td>-</td>
<td>35</td>
<td>69</td>
</tr>
<tr>
<td>Overall level of statistical capacity (scale 0-100)</td>
<td>-</td>
<td>86</td>
<td>87</td>
</tr>
</tbody>
</table>

Note: The bars measure Thailand’s performance in 2000 and 2016 (or latest year – as indicated accordingly) for a selection of 26 indicators across the 17 Sustainable Development Goals (SDGs). Indicators are chosen in line with the UN global framework and to ensure measurability. The 2030 aspirational target values refer to the pre-defined UN target (established by the UN IAEG and available at: https://unstats.un.org/sdgs/iaeg-sdgs/metadata-compilation/). Targets are all normalised to 100 for representation and comparison purposes.

Despite government efforts, corruption still holds back development. Thailand has long recognised the need to address corruption, which undermines trust and efficiency. Anti-corruption laws have increased and broadened over time, improving the independence and effectiveness of the National Anti-Corruption Commission (NACC). Even so, the perception of corruption remains higher than in the average of OECD and ASEAN countries, and over 40% of surveyed citizens report having to pay bribes, offer a gift or perform a favour for somebody when accessing public services.

To intensify anti-corruption efforts, the third phase of Thailand’s National Anti-Corruption Strategy (2017-2021) includes bold strategies to fight corruption and mitigate corruption risks. Thailand could consider streamlining the anti-corruption mandates of various institutions, particularly the NACC and the Public Sector Anti-Corruption Commission (PACC), in order to enhance the coherence of integrity and anti-corruption policies. Thailand could also benefit from further elaborating civil servants’ ethical obligations and ethics training. Setting high ethical standards would help to restore trust in the public sector and the proper use of public funds. In addition, Thailand could develop a dedicated whistleblower protection law to clearly define the scope of whistleblowing, wrongdoings and retaliation, and offer protection to whistleblowers. This
would foster an open public organisational culture where integrity concerns can be discussed, leading to effective detection of ethical violations.

**Distilling the cross-cutting challenges**

Four cross-cutting challenges emerge from these individual constraints. The *Initial Assessment* identified 20 constraints spanning the economy, society, government and the environment in Thailand. Mapping these constraints into a context of mutual relationship points to four cross-cutting challenges for Thailand’s development (Figure 1.10): a growth path with high structural and regional inequalities, resource-intensive growth with costly natural disasters, a fragmented social protection system in the context of informality and an ageing population, and fragmented management and delivery of public services.

Thailand needs to transition from a growth path with structural and regional inequalities to one that provides quality jobs for all. The share of basic agricultural and precarious urban employment remains disproportionally high given the level of GDP per capita. Informality impedes productivity growth, entrenches inequality and reduces the tax base. At the same time, the difference in regional economic and social performance remains too large. Better public services, especially in education, infrastructure and business facilitation, reaching all parts of the country, will be key to reinvigorating economic transformation and creating new activities that provide income and security for the whole population.
A more accessible and better financed social protection system is essential in the face of an ageing population and continuing high informality. Thailand’s age profile is more in line with high-income countries such as Korea and Singapore than regional comparators like Malaysia or Viet Nam. Accordingly, the country has struggled to ensure universal social protection coverage, notwithstanding successes in healthcare. A rapidly ageing population makes it harder to strengthen social protection while maintaining long-term fiscal sustainability. Thailand will need to widen social protection and implement skills upgrading to enable productivity growth to compensate for declining labour input.

Thailand also needs to transition from resource-intensive growth against a backdrop of costly natural disasters to more sustainable development with better-managed natural resources, enhanced disaster risk management and reduced pollution. Rapid urbanisation, industrialisation and intensive agriculture have put pressure on water resources and water quality. The government therefore needs to strengthen water resources management and limit the negative effects of natural disasters. Attention also needs to be paid to improving air quality and reducing waste generation.

Finally, the organisation of government and public service delivery lie at the intersection of the previous three development challenges. The different levels of government in Thailand need to overcome co-ordination issues and integrate more effectively. Under the current system, the complex organisation and uneven distribution of power and resources across central government bodies and local administrations contribute to co-ordination
problems and poor institutional capacity. Political participation and accountability should therefore be coupled with reforms that aim to fiscally empower local municipalities, such as building local capacity to raise revenue and determine expenditure, and guaranteeing transparent and fair access to intergovernmental grants.

**Building policy recommendations: Thailand must implement three transitions to reach the next level of development**

Further prioritisation identified three key transitions Thailand must implement to overcome the cross-cutting challenges and reach the next level of development. First, Thailand needs to unlock the full potential of each of its regions and build on convergence as a driver of structural transformation. Second, the country needs to develop a more effective organisational approach to multi-level governance, particularly with regard to financial resources. This is a crucial capability to support the new growth agenda. Under the current system, the complex organisation and uneven distribution of power and resources across central government bodies and local administrations contributes to co-ordination problems and poor institutional capacity. More effective multi-level governance is also crucial for the third transition, which pertains to water and the environment. Moving from a resource-intensive growth path with costly natural disasters to one characterised by sustainable development will require a new approach. In the case of water, this means moving from ad-hoc responses to effective management of water security.

**Figure 1.11. Poor regions have grown faster than richer ones, displaying potential for convergence**

Correlation between real GDP per capita in 2001 and the average GDP growth rate between 2001 and 2015, taking into account the relative size of regional GDP

*Note:* Calculations are based on chained volume measure of real GDP per capita. The Compound Average Growth Rate (CAGR) is used to measure the evolution of real GDP from 2001 to 2015. The size of the circle is proportional to the share of regional GDP to national GDP.

*Source:* Authors’ calculations based on national accounts, as provided by NESDC.

[StatLink](http://dx.doi.org/10.1787/888933949193)
**A new growth path: Unlocking the potential of Thailand’s regions**

Thailand’s growth path has created large disparities that now represent obstacles to the next stage of development. Past approaches to regional strategies gave rise to path dependence in productivity growth and affected regional productivity potential. Taking a closer look at Thailand’s peripheral provinces and cities suggests that convergence has started; however, not all laggards have caught up (Figure 1.11). To make the most out of the potential of convergence, Thailand must develop the necessary capabilities in terms of organisation and economic geography.

Going forward, Thailand will need more broad-based and innovative regional policies that put local innovation in the driver’s seat, provide flexible support, and capitalise on best practices and learning from top performers. An analysis of provinces at the productivity frontier points to superior human capital and public services as the distinguishing attributes of high-performing provinces and cities. Based on these insights, regional policies will need to support cities as the centrepieces of integrated regional development policies and focus on skills development as a tool of regional and urban policy.

**Moving towards more broad-based and innovative regional development policies**

The new agenda for regional development must balance economic, social and environmental objectives. Past interventions aimed at boosting development in Thailand’s regions have focused solely on growth in small areas. Future strategies should aim at combining a broader set of objectives, including social cohesion and environmental sustainability. The right mix between social and economic as well as environmental objectives may vary across the country.

Getting regional development planning right will require placing local innovation and discovery in the driver’s seat. Mastering this process of discovery at each level (national, regional and local) is key to successful economic development and continued productivity and employment growth. The overarching lesson from the “smart specialisation” agenda and past attempts at regional development in the European Union and elsewhere is that this process of discovery must be driven and mastered by local and regional actors. The role of government intervention is important but it is subsidiary. Policy intervention is required not to select the areas or activities for investing public resources but to facilitate and support the discovery process (OECD, 2013[14]).

The process and instruments for innovative regional development should be performance-based, flexible, and reflect the specific needs and capabilities of each region. Placing local discovery and ownership in the driver’s seat of innovative regional development requires an open process that is adaptable to the needs of each region. More advanced regions might require less in terms of direct support and can be supported simply with mutually agreed performance targets and related instruments. Areas with lower capabilities might require more in terms of direct assistance and a stronger level of oversight to ensure accountability (OECD, 2018[15]). Strong evaluation and performance measurement frameworks must be built into all approaches from the beginning and should be widely accessible to guarantee transparency, as a key building block of local ownership.

Similarly, the geographic scope of regional development policies should be flexible and focus on functionality. The current administrative organisation in Thailand offers the opportunity to include flexibility in the definition of regions for the new strategies.
analysis can help here to identify the most functional clusters of provinces for regional strategies. Functional areas may involve different provincial clusters and change over time. Neighbouring administrations that do not find co-ordination over specific issues particularly necessary today, may find it advantageous in the face of future global trends and shocks.

Data analysis should support local discovery processes, building on best performers to profile regions and provinces, assess potential and detect bottlenecks. Identifying each region’s best-performing province in terms of productivity, for example, helps to classify other provinces as “converging” or “diverging” with respect to specific objectives. This convergence-divergence analysis shows that most of the best-performing provinces inherited industrial estates created during the 1980s. In certain cases, agriculture, education and tourism have been pushing some provinces to the productivity frontier. Once regional best performers and their potential for productivity growth are identified, their characteristics can help devise policies for lagging provinces.

Supporting intermediary cities as engines of growth outside of Bangkok

Cities attract talent and economic development. Firms and workers are drawn to cities, thereby decreasing the cost of matching skills with the needs of enterprises in the labour market. Cities facilitate knowledge sharing and provide a vibrant environment to innovate and experiment. Hence, they help to retain the young and educated in regions that they would otherwise leave, leading to the depletion of human capital.

Cities can generate new opportunities for regional development outside of Bangkok, but need more resilient infrastructure. Since the beginning of the 2000s, intermediary cities in Thailand have been attracting more people than the capital, a trend that is increasing (Figure 1.12). In the North, urban centres such as Chiang Mai, Chiang Rai and Lamphun are attracting increasing numbers of people from rural areas who are looking for better salaries than those offered in smaller towns or for an alternative to the congestion of Bangkok. Urbanisation can become a powerful engine of regional growth, but it can also weaken citizens’ well-being and endanger the local environment in the absence of adequate local infrastructure.
Figure 1.12. Intermediary cities are attracting more people

Comparison between the evolution of urban population in the Bangkok agglomeration and the evolution of urban population in intermediary cities.

Note: “Population in the Bangkok agglomeration” measures the number of people living in the Bangkok metropolitan area. “Urban population outside the Bangkok agglomeration” measures the number of people living in urban areas outside of the BMA.

Source: Authors’ work based on (World Bank, 2017[11]).

StatLink http://dx.doi.org/10.1787/888933949212

Policies to develop intermediary cities require a new definition of urban areas, which can be elaborated with the help of satellite data. Efforts to support cities with policy require a good understanding of what constitutes an intermediary city and where they are located. At present, there is no clear definition of urban areas in Thailand. However, geospatial data can help to identify intermediary cities by looking beyond traditional administrative boundaries. Satellite imagery of 41 identified intermediary cities show widespread urban agglomerations in the East, while density is highest in the West.

Targeted surveys should support satellite data by assessing the needs of intermediary cities, the structure of the local economy and its dynamics, and the state of local infrastructure. These intermediary cities can trigger growth outside Bangkok and across Thai regions. Unlocking their potential should be at the core of new integrated regional policies.

Intermediary cities need to have the capacity to respond to institutional fragmentation and challenges specific to their location. Cities outside of Bangkok are growing. Integrated regional policies need the right institutional framework to successfully improve the management of network services. Furthermore, citizen participation can help handle challenges such as large seasonal inflows of tourism. Thailand is a major global tourist destination. Seasonal inflows of tourists are an opportunity, but can dangerously stretch the capacity of intermediary cities. Therefore, involving people who live and work in the city in governing the phenomenon and shaping the appeal of their city is paramount to prevent or manage possible negative externalities.
Adjusting the education system to the regional ambitions

Secondary and tertiary education are important drivers of productivity growth at the level of provinces and must be core elements of regional policy. About 40% of workers have completed at least upper secondary education in Thailand, significantly below the OECD average of 80%. The share moreover varies from 54% in the Bangkok Metropolitan Area to 28% in the Northeast (Figure 1.13). Analysis of best-performing provinces shows that educational attainment is an important element of performance and is significantly lower among lagging provinces. Regional policies should focus particularly on technical and vocational education and training (TVET) concerning secondary education, and on provincial universities for higher education.

Thailand is home to leading universities, but provincial institutions are struggling despite their potential as powerful engines for local innovation and productivity growth. Research universities in Thailand are gaining ground in the global arena and have already introduced innovation into certain industries. However, the country could do more to leverage provincial Rajabhat universities and tighten the partnership between the local private sector and government.

International experience suggests that local tertiary institutions can stimulate local entrepreneurship and innovation. In addition, higher education institutions provide content and audiences for local cultural programmes that ultimately contribute to the appeal of a province. However, local universities can only play their role in development if local leadership enjoys enough autonomy to fine-tune coursework and teaching modalities to local economic structure and issues.

Figure 1.13. There is significant variation in educated workers across regions

Share of employees by level of education attained

Note: The category “None” includes workers that have neither started nor completed primary education. Employees included all Thai citizens aged between 15-60.


StatLink http://dx.doi.org/10.1787/888933949231

MULTI-DIMENSIONAL REVIEW OF THAILAND © OECD 2019
Making multi-level governance work for Thailand’s transitions

The new regional policy framework requires dynamic actors with the freedom to experiment at each level of government. Local and provincial layers of government need to be given the flexibility and means to experiment, as opposed to implementing top-down policies designed at the central level. Experimentation allows policy makers to learn from the “small-step” interventions they pursue to address local issues. Moreover, experimental processes require mechanisms that capture lessons and ensure that these are used to inform future activities (Andrews, Pritchett and Woolcock, 2013[16]).

Decentralisation was mandated in Thailand’s Constitution in 1999; since then, several decentralisation reforms with ambitious quantitative targets have been implemented. However, Thailand’s governance system remains highly centralised. Strong, central government control over subnational governments has not led to uniform service levels or harmonised revenue bases. On the contrary, there are marked fiscal disparities between Thailand’s subnational governments. Thailand’s dual multi-level governance and high number of subnational governments (LAOs) makes the governance system complex and fragmented.

There are four possible alternatives available for Thailand to tackle the current problems. First, a clear nationwide plan should be developed to prepare for reforming the subnational government structure, financing system, and spending and revenue assignments. Second, the LAOs should be empowered by enhancing their spending and revenue autonomy. Third, reorganisation of current spending assignments between government levels should be prioritised. Merger reforms or enhanced co-operation should be considered to build adequate capacity of subnational governments.

The fiscal autonomy of subnational government is weak, and the share of subnational tax revenue in total tax revenue is one of the lowest among Asia-Pacific countries. Locally levied revenues represent only 10% of the total revenues of local authorities. Lack of capacity to raise taxes forces local authorities to rely mostly on shared revenues – the rates of which cannot be controlled freely by LAOs – and intergovernmental grants (Figure 1.14). Intergovernmental grants further curb the spending capacity of LAOs, since the central governments earmark their distribution to the achievement of specific projects.

A stronger own revenue base would contribute to the self-rule and accountability of Thailand’s subnational governments. Reform of the financing system should include property tax reform and transfer system reform, but a considerable strengthening of local revenue base would include giving LAOs at least one important tax base. One option to consider would be to allow a local surtax on the central government personal income tax.
Figure 1.14. Transfers and tax sharing dominate local administration revenues

Furthermore, subnational capacities to finance infrastructure in order to contribute to regional development need strengthening, as does subnational capacity for strategic planning and territorial development.

Towards effective management of water security

Environmental challenges, in particular those relating to water, must be better managed. Thailand’s natural environment is a vital asset and underpins key economic sectors such as agriculture and manufacturing, with a direct impact upon millions of livelihoods. As in many emerging economies, rapid economic growth has been achieved through the intense use of natural resources, exerting a heavy environmental toll. Thailand is also exposed to cycles of flooding and drought that cause loss of life and economic disruption. While natural climatic variables are important drivers of these phenomena, inefficient water management practices hinder an effective response to these challenges. Poorly planned urban expansion, the intensification of agriculture, and the deterioration or loss of watershed forests have led to the decline of flood-retention areas and flood plains, while water consumption behaviours, agricultural and industrial land development, urbanisation and population growth have all contributed to droughts and increased pollution (OECD, 2018[1]).

Thailand’s water challenges can be captured under the overarching theme of “water security”, described as maintaining acceptable levels of risk in four main areas: the risk of water shortage, the risk of inadequate water quality, the risk of excess water and the risk of undermining the resilience of freshwater systems. In the Thai context, water security concerns issues related in particular to floods and droughts, water use and allocation, water quality and the impacts of pollution.
As poor water security will hold back Thailand’s growth plans, the government needs to move from a crisis response to a risk management approach. Data and information, cohesive policies, strong leadership, and clarity on roles, responsibilities and decision-making are necessary to facilitate the move to a risk-based approach to water security. In addition, better governance and co-ordination between local and national authorities on water management is needed. Thailand should also make better use of economic instruments such as water charges, and ensure stakeholder management and engagement to facilitate any reform.

Regional development and water security are closely linked, as water security challenges affect the different regions of Thailand in a variety of ways. The Northeast region suffers from regular droughts but also flash floods, while the South is regularly hit by typhoons and floods. As a result, agricultural productivity in these regions (and the North) have suffered in recent years. Heavy industry and manufacturing is located in areas such as Rayong in the East, resulting in localised water quality challenges. However, the region can also be affected by flooding, as witnessed in 2011, when economic damage and losses from floods in the manufacturing sector were estimated at USD 32 billion (OECD, 2013[18]). As a result of the flooding, a number of international firms relocated to lower risk areas, impacting regional economies and Thailand’s international reputation. In general, annual average recorded damages account for a not insubstantial share of GDP (Figure 1.15).

Figure 1.15. Annual average damage from flood events as a share of GDP

Adopting a risk-based approach to managing water security will signify a shift from reactive to more proactive policies. Instead of responding to water crises, which can often entail excessive costs to society, governments can establish a process to carefully assess and manage risks in advance and review these on a regular basis. Once set, acceptable levels of water risks should be achieved at the least possible cost. Economic instruments, such as charging appropriately for water use and pollution, can help to achieve this (OECD, 2013[20]).
CHAPTER 1. SYNTHESIS OF MULTI-DIMENSIONAL ANALYSIS: NEW CAPABILITIES FOR THAILAND

References


In spite of remarkable growth rates, the North of Thailand remains one of the less developed and most unequal regions of the country. Certain provinces and areas are transforming into thriving hubs for manufacturing, logistics (connectivity with the Greater Mekong Subregion) and tourism services, while others lag behind and rely on rural activities with low productivity. To achieve long-term sustainable and inclusive growth, the North needs to identify and develop new sources of innovation and entrepreneurship. Based on workshops in Chiang Mai and Chiang Rai, this chapter proposes a process for creating an effective strategy for developing the region and key actions to strengthen local governments so they can be active partners in implementing the strategy. The chapter also discusses selected urban policies to transform Northern urban areas into liveable and productive cities, such as the creation of metropolitan authorities. Finally, the chapter focuses on actions that Northern provinces could take to leverage their rich network of universities and science parks and thereby nurture local entrepreneurial spirit.
The preceding analysis shows that boosting regional development must be a cornerstone of Thailand’s future development strategy. Thailand will need to develop new capabilities in terms of organisation and economic geography. The slower pace of economic transformation, quality job creation and reduction of regional inequalities in the new millennium has put pressure on the political system and the ability of the state to respond to growing needs for better public services and environmental management. Boosting convergence means building the capacity of all regions, provinces and municipalities to ensure they can make the most of their potential.

To develop concrete ideas for action the Analysis to Action phase of the Multi-dimensional Review of Thailand focuses on the North of Thailand. This is one of the fastest growing and most diverse regions of Thailand. Yet it is also the second poorest. It offers a wide range of opportunities and challenges.

Governmental learning workshops conducted in Chiang Rai and Chiang Mai helped to adapt the recommendations formulated in the In-depth Analysis and Recommendations volume of the Multi-dimensional Review of Thailand (OECD, 201811) to the Northern context and to identify concrete steps for policy implementation along the three dimensions of regional development (Box 2.1).

**Box 2.1. The Governmental Learning methodology and workshops**

The Governmental Learning workshops aimed to inspire key actors to propose recommendations for action and concrete steps for policy implementation (Blindenbacher and Nashat, 20102). They consisted of three sessions held in Chiang Rai and Chiang Mai during November 2018, and included the participation of public and private local stakeholders.

**Session I: Internalisation.** During this session, participants reflected on the content, recommendations and relevant experience of other counties presented in MDCR Volume 1 – Initial Assessment and MDCR Volume 2 – In-depth Analysis and Recommendations. The goal of this session was to brief participants about the MDCR national recommendations and to discuss their adaptation to the Northern context.

**Session II: Prioritisation.** Each participant selected a recommendation to put into action, based on their prior experiences, background and knowledge of regional needs. The OECD team then moderated a debate at the end of which priorities were clustered into three to four themes, and working groups were formed accordingly.

**Session III: Action plan.** Working groups translated the recommendations into concrete plans for action and strategies for implementation. The authors of the policy recommendations were available to answer questions from the working groups and provide feedback during the development of their plans and strategies. The different groups then presented their plans and strategies in a final plenary session. The plans of action proposed in this report are based on the outcomes of the workshops.

*Source:* Adapted from (Blindenbacher and Nashat, 20102).
The next section provides a diagnostic of the context, challenges and potential of the Northern region of Thailand. The following section presents the suggested Action Plan and way forward.

**The Northern Region: Context, challenges and opportunities for socio-economic development**

Over recent decades, government policies have triggered structural transformation and boosted the growth of the North of Thailand. Until the 1970s, agriculture dominated the regional economy and manufacturing activities were typically organised in small-scale companies. The 1980s were a turning point. The establishment and consolidation of a special economic zone transformed Lamphun province into a major manufacturing hub and created new jobs in the trade and service sectors in neighbouring provinces. The abundant supply of cheap labour from neighbouring countries such as Myanmar, as well as foreign direct investment from Japan, contributed to the growth in momentum. Since the 2000s, the manufacturing industry has expanded and the financial sector has gained in importance (Figure 2.1).

**Figure 2.1. The agricultural and manufacturing sectors contribute one-third of regional GDP**

The figure shows the sectors that together contribute to around 70% of regional GDP in the North and the rest of Thailand

<table>
<thead>
<tr>
<th>Year</th>
<th>Manufacturing</th>
<th>Agriculture</th>
<th>Trade</th>
<th>Education</th>
<th>Finance</th>
<th>PA</th>
<th>Real estate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>7%</td>
<td>11%</td>
<td>8%</td>
<td>12%</td>
<td>21%</td>
<td>10%</td>
<td>7%</td>
</tr>
<tr>
<td>2015</td>
<td>7%</td>
<td>11%</td>
<td>17%</td>
<td>9%</td>
<td>13%</td>
<td>10%</td>
<td>28%</td>
</tr>
<tr>
<td>2015</td>
<td>8%</td>
<td>11%</td>
<td>17%</td>
<td>9%</td>
<td>13%</td>
<td>10%</td>
<td>28%</td>
</tr>
</tbody>
</table>

*Source: Authors’ work based on GDP data provided by the National Economic and Social Development Council (NESDC).*

*StatLink* [http://dx.doi.org/10.1787/888933949288](http://dx.doi.org/10.1787/888933949288)

Structural transformation and proximity to the Ping river boosted the productivity of the local agricultural sector. The former brought capitalisation and industrialisation of agriculture, while the latter helped to commercialise local products. Kamphaeng Pet, for example, hosts the largest plantation of tapioca in the country and has benefitted notably from a rapid increase in the volume of trade in this root. Meanwhile, coffee and niche products such as longan and local herbs have become trademarks of Chiang Rai. In Chiang Mai, the integration of local landowners and farmers in the agro-industry value chain has generated local jobs and business opportunities.
Tourism and recreational activities are another major regional asset. Tourists are discovering new destinations in addition to Chiang Mai, which has traditionally been the regional hotspot. In 2016 and 2017, Chiang Rai recorded the second highest number of visitors at 3.5 million (visitor numbers to Chiang Mai are three times higher). Tourists were attracted by the rich cultural heritage of the area, Lanna handicrafts and the local celebrations of the Songkran festival. Government programmes such as the One-Tambon-One-Product projects have contributed to the development of local artisanal products that attract visitors from the rest of Thailand and other countries. In 2017, revenue from tourism in the North amounted to THB 175 billion, averaging THB 10.3 billion per province (THB 99 billion in Chiang Mai and THB 26 billion in Chiang Rai). Since 2018, the government has introduced tax deductions to encourage tourism to all Northern provinces, with the exception of Chiang Mai, as part of a nationwide effort to promote travel to less visited provinces.

Figure 2.2. Northern provinces have been growing fast
Provincial growth of real GDP per capita, 2000-15

Source: (OECD, 2018[1]).

StatLink http://dx.doi.org/10.1787/888933949307

The North is eager to deepen the structural transformation process that has so far contributed to regional growth. Increasing productivity in both the agriculture and non-agriculture sector fuelled growth in the past decade (Figure 2.2). Productivity growth in non-agriculture activities is improving steadily, with the manufacturing industry scoring the highest increase in productivity between 2001 and 2015 (6% per year), amounting now to THB 169,956 per worker. The relatively high GPP per worker in industry also yields higher wages, which may attract further workers to the labour force in the future. Similarly, more and more workers will be employed in the service and transportation sectors.
Cities are catalysts of investments and growth. Today, Chiang Mai is the second largest city in Thailand by population and a centre of innovation and entrepreneurship. Chiang Rai is confident that cross-border infrastructural investments will bring more visitors to the city’s main attraction – Wat Rong Khun and other temples – and to other destinations in the province. In addition, urban clusters have been developing across the border with Myanmar. The agglomerations of Mae Sai and Wan Sa-te, and Mae Sot and Myawadi, are signs of growing economic integration of the North with the ASEAN region. Urban areas on the border function as Thailand’s gateways to the economic corridor developing between Kunming in China’s Yunnan Province, and Mandalay in Central Myanmar.

With the third highest number of universities in Thailand after the Bangkok Metropolitan Area and the Northeast, the North has the means to support structural transformation with innovation. Furthermore, in addition to the notable universities and research centres of Chiang Mai and Chiang Rai, eight provincial universities (rajabhat) have become centres of support for local communities and local small and medium-sized enterprises (SMEs).

The economic engine of the North faces several challenges, however, that could undermine its momentum. In spite of fast GDP growth, the North remains a poor region with high inequality. The average household monthly income in the region is lower than in the rest of the country (THB 19,509 against THB 23,542 at the national level), and three of its provinces have the lowest values in Thailand (Chiang Rai at THB 13,497, Chiang Mai at THB 14,950 and Mae Hong Son at THB 15,119). Sectors like mining, public utilities and transportation contribute significantly to provincial wealth but have a low labour intensity. As a result, the income generated may be confined to a relatively small share of the local population, rather than benefiting the whole community. Today, the North is the third most unequal region in the country, after the Northeast and the South.

The agricultural sector, while still significant at the regional level, is underperforming. Agriculture contributes 18% on average to provincial GDP, with the local contribution ranging from 4% (in Lamphun) to 27% (in Phichit). Half of the labour force is employed in the agricultural sector, ranging from a minimum of 31% (in Chiang Mai) to a maximum of 66% (in Mae Hong Son). Since 2001, the productivity (the added value per worker) of the agricultural sector has increased by 2% a year and amounted to THB 35,625. Nonetheless, the sector grew much slower than manufacturing (4 percentage points lower) and agricultural value added per worker in the North lags much behind the national average (THB 50,506).

Fast urbanisation may risk hindering, rather than promoting, sustainable economic growth. In Chiang Mai, for example, more and more urbanites are moving from the city centre to the outskirts, where larger and cheaper plots of land are available. In contrast to 20 years ago, most commutes now originate outside of the city centre and rely on car or motorbike. The car ownership rate in Chiang Mai is similar to that in Bangkok (304 and 316 cars per 1,000 individuals, respectively) and is increasing rapidly. At the same time, the proportion of trips by public transport is decreasing (Jittrapirom, 2015(#4)). Without appropriate transport infrastructure, motorisation is likely to transform Northern cities into congested agglomerations, with serious consequences for citizens’ well-being and the environment.
Proposed actions: Building capabilities to exploit the full potential of the North

Building on the OECD’s recommendations in previous volumes and the workshops with local stakeholders in Chiang Mai and Chiang Rai, the following actions can help the Northern Region of Thailand kick-start a new dynamic of development. The overarching objective is to develop the capabilities to exploit the North’s full potential. Three capabilities are key in this context – an effective strategy and strong LAOs, Metropolitan areas that drive the region’s development, and universities and colleges that act as key drivers of development (Figure 2.3).

Building capabilities and creating successful strategies is a process of trial and error that requires the collaboration of many players. The following actions should thus be read as a guide to such a process. The scorecard in chapter 4 of this report proposes a set of indicators for measurement of performance throughout the process. In combination this action plan and the scorecard can thus help to transform the North of Thailand into a ‘Policy Lab’ where innovative actions and ideas for regional development can be tested.

An effective strategy and strong LAOs drive the development of the North of Thailand

Unlocking the potential of the Northern Region requires an effective strategy for the region as well as strong LAOs that can be key partners in the implementation of the strategy.

Getting regional development planning right will require placing local innovation and discovery in the driver’s seat. Mastering this process of discovery at the central, provincial and sub-provincial levels of government is key to successful economic development and continued productivity and employment growth.
Local authorities will need fiscal, political and administrative power to support and follow up on the results of the strategy process, develop local potential and swiftly remove obstacles to business. Moreover, the government could award provinces that successfully implement innovative regional development strategies with access to additional public funds.

Create a strategy for developing the Northern Region, building on local discovery (Expected result 1)

“Smart Labs” are proposed here as the centre piece of a strategy creation process. These labs should be supported with analysis of economic, social and geographic data to identify potential for specialisation, as well as optimal clusters of provinces. Together with such data analysis, smart labs can provide the basis for investment decisions and performance monitoring (Figure 2.4).

**Figure 2.4. A four-step approach to designing and implementing innovative regional development strategies**

Several conditions apply: Getting regional development strategies right requires 1) placing local innovation and discovery in the driver’s seat 2) a strong focus on performance and 3) co-ordination to ensure coherence of plans and policies.

The first overarching lesson from the “smart specialisation” agenda and past attempts at regional development in the European Union and elsewhere is that this process of discovery must be driven and mastered by local and regional actors. The role of government intervention is important but it is subsidiary. Policy intervention is required not to select the areas or activities for investing public resources but to facilitate and support the discovery process (OECD, 2013[5]).

Second, Strong evaluation and performance measurement frameworks must be built into all approaches from the beginning and should be widely accessible to guarantee transparency and accountability, as key building blocks of local ownership. Policy makers could use the scorecard presented in Chapter 4 to track the outcomes of innovative regional development strategies.

Third, the outcomes of the Smart Labs will take the form of sectoral strategies that should be combined into a “regional masterplan”. This masterplan should guarantee coherence between the provincial-level outcomes of the process, existing place-based policies, and the National Economic and Social Development Plan (NESDP).
Smart Labs for entrepreneurial discovery of business and innovation potential (Recommendation 1)

“Smart Labs” are proposed here as the centre piece of a strategy creation process. They bring together private and public agents to identify and agree on the key development opportunities of a provincial cluster. The purpose of Smart Labs is threefold. First, the knowledge and views of participants complement the results of the data analysis, which may not capture local cultural nuances and specificities driving local comparative advantage. Second, they provide participants with an opportunity to agree on the bottlenecks that the central and local government need to remove to unleash the potential of comparatively advantageous sectors. Table 2.1 summarises the concrete steps that the North could take to operationalise Smart Labs, based on the experience of the Dolosaskie region of Poland.

<table>
<thead>
<tr>
<th>Table 2.1. Concrete actions to operationalise Smart Labs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action</strong></td>
</tr>
<tr>
<td><strong>Interviews</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Smart Lab</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Source:** Authors’ work based on (Foray and Rainold, 2013[6]; World Bank, 2016[7]).
Box 2.2 discusses the successful implementation of a form of Smart Labs in Peru (Mesa Ejecutiva). Lastly, the Smart Labs are a crucial step to ensure that all stakeholders in charge of the implementation of regional development strategies are actually involved in the planning process.

Box 2.2. The impact of innovative regional development strategies in Peru: Smart specialisation and the Forestry “Mesa Ejecutiva”

Between December 2014 and May 2016, the Ministry of Production of Peru launched the “Mesa Ejecutivas” initiative. A Mesa Ejecutiva is a public-private working group that takes concrete action to enhance the productivity of a sector. One example of such action is the forestry sector, a sector where Peru could develop a significant comparative advantage, but local obstacles present frequent challenges.

The Forestry “Mesa Ejecutiva”

Peru has about 18 million hectares of forests, half of which are available for concession use. The trees are of a high-quality type of wood, which is ready to be processed. However, until the beginning of the 2010s, less than 2 million hectares were exploited. Peru used to export only approximately USD 150 million worth of forest products per year (and import USD 1.2 billion), compared to Chile’s USD 5.5 billion.

Administrative complexity and unclear property rights were two of the reasons behind the under-exploitation of this resource. Many different government agencies and organisations regulate and oversee activity in the forestry industry. Until the beginning of this decade, the roles of these agencies often overlapped, thus making information exchange difficult. As a result, there was no clear picture of the industry’s assets and liabilities. Moreover, illicit and harmful extraction practices were common, given that property rights were not clearly defined.

Pre-Mesa Ejecutiva | Post-Mesa Ejecutiva
--- | ---
The procedure to register plantations on private property lands took between 6 and 12 months | The Registration Procedure at the National Forest Plantation Registry (RNPF) lasts at most three days. It is automatic and free of charge.
The extraction permit procedure took between 4 and 8 months | No extraction permit is required apart from in exceptional cases.
The Forest Management Plan was not acknowledged as an Environmental Impact Assessment (EIA). | The Management Plan is explicitly acknowledged as equivalent to an EIA.
The country has no history of legislation for the forest plantation industry. | Forest plantations have their own legislation now within forest regulation.
Authorities and citizens could not easily access information on concessions, titles, assessments’ outcomes or sanctions, because information was fragmented and not easily accessible. | Data are now concentrated in a unique and online database accessible to anyone.
There were no identified and available lands for forest plantations. | Relevant agencies have prepared a methodology that results in a single systematised and integrated database. Work is validated in the field and provides detailed information on the current state of lands (occupation, invasion, deforestation, etc.).
The last public forest concession tender processes in the country led by regional governments occurred between 2002 and 2004. | The Loreto Regional Government launched the first call for forest concessions. Other regional government are following.

In December 2014, the central and six regional governments established the Forestry Mesa Ejecutiva to overcome existing barriers to the development of the forestry industry. The Mesa Ejecutiva helped to identify three types of bottlenecks hindering growth: (1) poor regulation and
overwhelming red tape, (2) lack of innovation and low productivity, and (3) insufficient access to funding for local landowners. Moreover, the Mesa Ejecutiva helped to address co-ordination issues within and between the public and private sectors.

The Forestry Mesa Ejecutiva helped to establish property rights and regulated the forestry industry. Within few months, it had scored several major achievements. For example, it promoted implementation of the Law for Forestry and Wildlife, discussion of which had slowed due to the involvement of numerous actors. Moreover, the public-private workshops facilitated access to finance for landowners, and made co-ordination and data sharing across interested agencies possible.

The Mesa Ejecutiva also facilitated the establishment of a Pucallpa Forest “technological innovation centre” in the forestry industry. The centre will foster innovation in production processes, transfer technology to small and medium enterprises, and attract qualified foreign experts. Its laboratories will award quality certifications, help standardise manufacturing, improve wood drying and cutting, and thus instil the competitiveness required to take full advantage of the Peruvian industry sector. The following table summarises some of the main outcomes of the Forestry Mesa Ejecutiva.

In November 2016, the Governor of one the most important of Peru’s six forestry regions created a regional Mesa Ejecutiva to focus on specific regional problems. The regional Mesa Ejecutiva included smaller landholders, who were under-represented in the original Mesa Ejecutiva.


Support strategy process with analysis of product and innovation data, as well as crowdsourcing (Recommendation 2)

Several tools of data analysis and crowdsourcing could support the regional strategy process. Depending on data availability, LAOs in Thailand can employ several indicators and methodologies to measure the scope for local specialisation.

1) The Herfindahl-Hirschmann (HH) index of economic concentration measures the size of local economic sectors in relation to the overall provincial GPP. Sectors are classified according to the International Standard Industrial Classification (ISIC) at the two-digit group level. An index value closer to 1 indicates a province’s economy is highly concentrated in a few sectors (i.e. concentration is very high). Conversely, values closer to 0 reflect provincial economies that are more homogeneously distributed among a series of sectors. Chapter 4 provides more details.

The North has the second highest concentration index in the country, but presents high within-region variability. As of 2016, economic activity in the North is as concentrated as in the South and is second to the East, where manufacturing is the dominant sector. Chiang Mai and Lampang are the Northern provinces with the most diversified economies, while Phayao and Phichit have the most concentrated. In fact, Phichit is among the top 10% most concentrated economies in the country due to its traditionally large agricultural sector (accounting for around 40% of GPP in 2016). Between 2012 and 2016, the Herfindahl-Hirschmann index in the region has decreased because the economic activity is spread more evenly across sectors.
2) The Product space methodology. This methodology is based on the idea that a country is more likely to specialise in and trade goods whose production requires similar capabilities, such as those relating to institutions, infrastructure, physical factors, technology or some combination thereof (Hidalgo et al., 2007[9]). For example, a country specialising in processing rice will probably possess most of the conditions suitable for manufacturing starches from rice. It would possess the appropriate soil and climate, together with the requisite packing technologies and machines. It would also have the human capital, notably agronomists, who could apply their knowledge on rice starches.

If micro-data allow, the product space methodology could help identify more precisely the current and future potential of growth of provinces. Since trade data are not available at the subnational level, Thailand could replace them by computing the net value added by sector based on information from the industrial census. The analysis will be efficient if net value added is computed at the finest level of detail, for example at the ISIC four-digit level. Annex 2.B provides some extra details on the steps and computations needed to operationalise the product space methodology at the subnational level.

3) Innovation maps could make regional development strategies even more effective and inclusive. In particular, Northern authorities and the Board of Investments (BOI) could map all local firms that applied for grants. Since the application process necessarily requires the disclosure of planned private R&D investment, such mapping could help infer entrepreneurs’ perception of ongoing and emerging business and technology trends. Next, the BOI could classify grants in accordance with international guidelines, which sort firms according to their type of business activities and their technological potential. The OECD and the Eurostat have successfully defined such categories.

Innovation maps helped identify key priorities for business innovation spending and steer smart specialisation policies in Poland. In 2015, the National Centre for Research and Development of Poland and the World Bank produced an initial set of innovation maps for a number of regions. The maps were based on more than 1,000 applications filed within the framework of a new innovation support programme, and showed current local private investment and the ambitions of local entrepreneurs. For instance, “electronics and IT engineering” was the business area that attracted the majority of private investments, followed by “mechanical engineering” and “material engineering”. “Health and medicine” was the key technology in which the private sector wanted to invest (World Bank, 2016[7]).

4) Crowdsourcing tools would contribute to the participation in the regional planning process of firms that have not been involved in Smart Labs. These firms could provide useful insights into the obstacles of doing business or untapped local potential, for instance by filling regular online questionnaires. In exchange, participating companies could receive information on their performance relative to their industry peers or access to technology and business newsletters. Outstanding and insightful firms can be included in the next meetings of Smart Labs.
Figure 2.5. The definition of homogeneous clusters of provinces should help regional development strategies to adapt to within-region diversities

Note: Bold lines indicate current regional borders, while thinner lines are the current provincial borders. The Max-p clustering method identifies seventeen regions in total that contains at least 8% of the overall population. Each region has been assigned to a unique pattern.

Source: Authors’ work based on data provided by the NESDC.
Define optimal provincial clusters to target smart labs and the development strategy (Recommendation 3)

To be effective and coherent, smart regional strategies need to account for the diverse ambitions, contexts and assets within the North. Regions in Thailand often encompass provinces that face different social, economic and environmental challenges, and that have different visions for their development. As an illustration, consider the three Northern provinces of Chiang Mai, Chiang Rai and Tak. The results of the survey, workshops and interviews suggest that Chiang Mai is prepared to establish centres of agricultural innovation, while Chiang Rai is capable of stimulating sustainable tourism, and Tak is ready to emerge as a logistics hub connecting Thailand with neighbouring Myanmar.

Regional strategy processes should take provincial clustering into account. Figure 2.5 displays a possible set of clusters of provinces that are similar with respect to a broad set of social, environmental and economic characteristics. Box 2.3 provides further details about the clustering methodology and the indicators used.

The scope of innovative regional development strategies may transcend existing regional boundaries, requiring effective co-ordination mechanisms. Thai regions resulting from the clustering exercise comprise a mosaic of different provincial clusters and cross traditional regional boundaries. In the North, Chiang Mai, Chiang Rai and Tak belong to three separate clusters, reflecting differences in underlying characteristics.

Figure 2.5 shows that certain provinces are more similar to neighbouring administrations that belong to different regions than to provinces within the same region. When designing the process for innovative regional development strategies, central and local administrators should create and deepen mechanisms for inter-provincial and inter-regional co-ordination, in order to address these cross-border affinities.

Box 2.3. An innovative methodology to define provincial clusters in Thailand

The Max-\(p\) clustering method

The Max-\(p\) clustering method involves the clustering of provinces into the maximum number of homogeneous regions such that a regional attribute is above a predefined threshold value (Duque, Anselin and Rey, 2012[10]).

Figure 2.5 presents a set of nine clusters that contain at least 8% of the country population. This configuration should be robust to the population threshold chosen. On the one hand, the lower the threshold, the less stringent the constraints imposed on the clustering algorithm, and the higher the number of clusters. On the other hand, the configuration should only partly change and the same pattern of clusters should emerge. Annex Figure 2.A.1 shows a set of clusters each containing at least 4% of the country population. The configuration and geography of clusters does not change significantly from Figure 2.5 as the population threshold is raised.

Differently from other clustering techniques, the Max-\(p\) method requires that provinces within the same cluster also share a border. The underlying algorithm endogenously identifies the number of clusters and the number of provinces within the cluster.
Strengthen LAOs in the Northern Region – experiment with innovation in tax collection and transfers (Expected result 2)

Participants of the workshops held in Chiang Rai and Chiang Mai discussed three broad sets of actions necessary to implement decentralisation: (1) test innovative methods for property tax collection; (2) invest in local capacity building; and (3) experiment with a simplified but more effective system of transfers.

Test innovative methods for property tax collection to increase LAO revenues (Recommendation 4)

Starting from 2020, a new property tax will improve the fiscal autonomy of local authorities in Thailand, although limitations remain. The new “Land and Building Tax” act is set to replace the previous regressive and outdated property tax. It aims at decreasing income disparity, encouraging land use and increasing public revenue. Local administrations will be able to tax at a higher rate than the rate set by the central government. However, local surcharge rates cannot exceed the pre-determined ceiling. The tax system will not apply to owners of agricultural land worth up to THB 50 million, which, according to the National Statistical Office (NSO), make up more than 90% of landowners.

The new tax regime will be effective only if central and local authorities revise their cadastral information, possibly according to international standard procedures. The value of land plots and buildings that is currently in use stems from the 1980s and requires updating. In this regard, the “Land and Building Tax” act could have been more ambitious and propose more innovative methods to appraise the value of parcels.

Northern authorities could pioneer an innovative, collaborative and transparent cadastral database. Complete cadastral registers usually rely on a combination of administrative sources and collection sources. Table 2.2 summarises OECD guidelines to harmonise registers along these two axes. Importantly, registers should be integrated, accessible to all relevant agencies – to improve effectiveness – and to citizens – to strengthen transparency and accountability. A cadastral database could also include geospatial and aerial data (Box 2.4). In this regard, in 2014 the Treasury Department developed the application “Smart GIS TD: Smart App for Smart Service” to facilitate land evaluation using GIS data and broaden the property tax base in 24 provinces. The app became accessible to all other provinces shortly thereafter.
Table 2.2. Data sources for the standardised cadastral database

<table>
<thead>
<tr>
<th>Administrative sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Textual component — the land register identifies real property parcels, which include all land parcels, and identifies owners’ rights, restrictions and responsibilities, ownership, easements, mortgages, etc.</td>
</tr>
<tr>
<td>• Spatial component — cadastral maps show all land parcels graphically corresponding to the registered title with plan numbers and unique identifiers. These are all now digitised. Cadastral maps consist of fixed and general boundaries, which account for about 90% and 10%, respectively:</td>
</tr>
<tr>
<td>o Fixed boundaries are those with legally surveyed measurements used to precisely identify most parcel boundaries determined by cadastral surveys such as subdivisions, etc.</td>
</tr>
<tr>
<td>o General boundaries (graphical) are not survey accurate and are based on natural or human-made physical features, such as high water marks or walls and buildings, as found on cluster or strata titles.</td>
</tr>
<tr>
<td>• Additional legal, valuation, local government, utilities and planning activities are involved in land administration, and are heavily reliant on the fundamentals of the cadastral system. In particular, local government rates, land tax and stamp duty (as a result of land transfer) on land parcels are major sources of revenue for the economy.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Collection sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>• National land surveys capture various characteristics of land such as how the land is used and the size.</td>
</tr>
<tr>
<td>• Agricultural census are a common source of information for various types of land used for agricultural purposes, such as land under cultivation.</td>
</tr>
<tr>
<td>• Population censuses are common sources for counts of the number of dwellings in a country. Since census information is usually not collected and published annually, construction statistics (e.g. dwelling completions and demolitions) can be used to interpolate between census years and to infer current figures starting from the latest census year.</td>
</tr>
<tr>
<td>• Statistical surveys requesting the value of land. Business accounting data record the value of the land separately from the value of buildings and structures, but such estimates would most likely be valued at historical cost on their balance sheets instead of current market values.</td>
</tr>
</tbody>
</table>

Source: Authors’ work based on (Eurostat/OECD, 2015[11]).

Box 2.4. Spatial data to improve property tax collection in India

The Jawaharlal Nehru National Urban Renewal Mission was an ambitious city-modernisation scheme launched by the Government of India under the Ministry of Urban Development. It provided financial incentives to municipalities that reformed their property tax systems. In particular, it emphasised the need for implementation of an online system for property tax through the proper mapping of properties using a GIS system.

The East Delhi Municipal Corporation has created an up-to-date map of parcels by combining an aerial survey of the region with satellite data. Authorities conducted a door-to-door field survey of individual properties to classify properties as commercial, residential or educational.

The Bhopal Municipal Corporation has also introduced a GIS-based system that will facilitate the management of property tax online. Residents will use an e-government platform to pay water charges and property tax through one bill, unlike the present situation where users pay water charges and property tax separately to the corporation. The GIS-based system allows for the provision of a unique property code for all commercial and residential units in Bhopal, based on which one bill will be prepared per code. The code remains the same even in the event of a change in property ownership.
Invest in local capacity building and peer learning for improved local fiscal capacity (Recommendation 5)

Ad-hoc committees should ensure effective compilation and management of the cadastral database. National and regional authorities need to make sure that the different LAO administrations have the capacity to update the registry on a regular basis. In this regard, in January 2019 the Department of Local Administration under the Ministry of Interior released two software packages to train LAOs in using GIS data for mapping lands and assets (LTAX 3000 and LTAX GIS). The central government could experiment with fiscal incentives (e.g. access to ad-hoc funding) to reward Northern LAOs that download these packages and keep on updating their staff’s land evaluation skills. Moreover, these conditional funds should encourage information sharing between LAOs, relevant agencies and citizens.

Training offered to municipal staff and officials could help to improve local fiscal capacity. Municipalities could earmark a stable percentage of their annual budget for staff and official training, and allot time for the pursuit of continuing education. Local universities and local administrations, together with the Ministry of Interior and the Ministry of Education, could design certificate programmes to update staff’s skills in, for example, technical writing, workforce development and retention, and financial accounting. In light of the innovative methods needed to improve property tax collection, the coursework could also include workshops on geospatial data analysis and provide hands-on sessions.

Local administrators in the North need a space for mutual learning and peer reviewing. A “Northern Municipal League” could set up peer groups of public sector employees to discuss challenges, needs, and local priorities in regular and informal meetings. These meetings, moreover, would provide opportunities to share successful strategies and strengthen relationships that lead to municipal partnerships. The League also could envisage a mayoral mentor programme, pairing interested mayors who face common issues and have analogous ambitions.

Experiment with a simplified but more effective system of transfers (Recommendation 6)

The redesign of the grant system would strengthen the autonomy and capacity of LAOs. The current system of inter-governmental grants is often ineffective, as general grants fail to achieve their objective of equalising fiscal capacity across LAOs and do not reward autonomous initiative by local administrations. Furthermore, the allocation of earmarked grants is conditional to the implementation of central government’s plans and programmes, and thus undermines LAOs’ accountability and entrepreneurship.

The North could test new accurate models to redistribute general grants according to LAOs’ needs. Thailand could consider altering the general grant formula to take into account better the differences in tax-raising capacity and service needs among LAOs. The formula could also factor in service costs. In this regard, Italy and Japan can serve as a benchmark for a similar reform in the North of Thailand (Box 2.5).
Box 2.5. Data-driven approaches to equalising fiscal capacity and spending needs across regions: The cases of Italy and Japan

Italy: Grants to equalise costs of provision of local public services

Italy has been introducing grants that equalise the spending capacity of local authorities. The aim is twofold. In terms of equity, equalisation grants guarantee that all authorities have enough resources to provide local services with uniform standards of quantity and quality. In terms of efficiency, equalisation grants cover only “standard costs” of provision of public services. The grants therefore stimulate higher accountability of local administrators, since expenditure levels above standard costs must be financed directly by local resources.

In Italy, equalisation grants are distributed according to a two-stage procedure. An equalisation fund is defined every fiscal year. A fixed amount of resources is then redistributed based on the estimation of “standard costs” for each local public service and municipality. The estimation of “standard costs” takes into account the type of services provided, the territorial features, and the social-economic and demographic characteristics of the resident population. As of today, the distribution of equalisation grants based on standard costs applies to municipalities only. The evaluation of standard costs for regions is ongoing.

Japan: Local tax allocation to level local fiscal capacities

Japan reallocates a part of national tax income to its regions depending on local basic needs and capacities. In 2016, a predetermined share of the following tax revenues was redistributed: income tax and corporate tax (33.1%), liquor tax (50%) and consumption tax (22.3%). The reallocation depends on the difference between the standard financial requirements and the standard financial revenues of a local body, as summarised in the following table. The calculation of expenditure needs is based on an assessment of service standards for each local government, which in turn depends on per-unit expenses, indicators of fiscal cost, and ad-hoc adjustment coefficients of each administrative service or task. The calculation of standard financial revenues is based on standardised local tax revenues multiplied by 75%, in order to incentivise local tax efforts and to create fiscal room for policy initiatives. The local transfer tax and other general subsidy allocations are then added together.

Table 2.3. Calculation of the Local Allocation Tax in Japan

| Financing gap = (Standard financial requirements) – (Standard financial revenues) |
|---------------------------------|---------------------------------------------------------------|
| **Standard financial requirements** = unit cost of service provision x measurement unit x adjustment coefficient |
| **Standard financial revenues** = standard local tax revenues x 0.75 + local transfer tax allocation, etc. |
| **Unit cost:** per-unit expense of each administrative service/task |
| **Measurement unit:** population and other indices to assess the fiscal cost of each service/task |
| **Adjustment coefficient:** to reflect differences in cost of provision owing to natural or social conditions |

(e.g. extreme climate, demographic factors, remote location)

Based on the Italian and Japanese experience, Thailand could experiment with similar systems in the North by first addressing their limitations. For instance, allocations should reflect actual needs and not historical levels of provision. The criteria for service-cost equalisation cannot be manipulated. Finally, equalisation objectives must be balanced...
against the need for greater resource efficiency, especially in provinces where the
population is shrinking because of ageing or outflow migration of the young labour force.

Source: (OECD, 2018[3]).

In addition to a new model for general grants, Northern provinces could experiment with
a result-oriented and participatory approach to allocating conditional grants. Access to
these grants could depend on the achievement of a broad set of social, environmental and
economic targets. Targets should be the result of negotiation between representatives
from the central government, LAOs, enterprises (ideally through the Smart Labs) and
citizens. They should suit the characteristics and needs of different provinces or clusters
of provinces – as defined in Figure 2.5.

Moreover, targets should be clearly identified and their achievement measured through a
series of indicators that can be compared across provinces and, when possible,
internationally. Italy has been testing this new way of earmarking conditional grants and
can serve as a useful example for a similar reform in Thailand (Box 2.6).

Box 2.6. Performance-based grants in Italy

Italy has been reforming its approach to regional development policy since the 1990s.
Changes concern not only underlying principles, but also policy delivery mechanisms. As
in Thailand, the trend towards decentralisation to lower levels of administration has
required new ways of co-ordinating a growing number of actors in the field of regional
development. In this context, at the beginning of the 2000s, Italy embraced a result-
oriented approach to planning and expenditures: the National Performance Reserve.

<table>
<thead>
<tr>
<th>Objective</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education: Improve students’ competencies, reduce dropout and broaden learning opportunities for the population.</td>
<td>% of early school leavers&lt;br&gt;% of students with poor competencies in reading&lt;br&gt;% of students with poor competencies in maths</td>
</tr>
<tr>
<td>Child and elderly care: Increase the availability of child and elderly care to favour women’s participation in the labour market.</td>
<td>% of municipalities with child care services&lt;br&gt;% of children (age 0-3) in child care&lt;br&gt;% of elderly people benefiting from home assistance</td>
</tr>
<tr>
<td>Urban waste management: Protect and improve the quality of the environment, in relation to urban waste management.</td>
<td>Amount of urban waste disposed in refuse tips&lt;br&gt;% of recycled urban waste&lt;br&gt;% of composted waste</td>
</tr>
<tr>
<td>Water service: Protect and improve the quality of the environment in relation to integrated water services.</td>
<td>% of water distributed&lt;br&gt;% of population served by waste water treatment plants</td>
</tr>
</tbody>
</table>

Initially, the National Performance Reserve had three main objectives: (i) the
simplification of public administration, (ii) improvement of spending efficiency, and
(iii) the promotion of projects that require co-ordination among local administrators (also
known as “Territorial Integrated Projects”). To achieve these objectives, a new
mechanism envisaged the redistribution of 4% of 2000-06 EU Structural Funds among
Italy’s 21 regions conditional on the achievement of a series of targets. The targets were
the result of a two-year negotiation that involved high-profile political representatives of
the central and regional governments.

The National Performance Reserve evolved throughout the 2000s. The Italian National
Strategic Framework 2007-13 introduced a new set of targets to improve citizens’ quality
Northern cities drive regional development

Re-organise urban policies for performance and accountability
(Expected result 3)

Re-define metropolitan areas based on functionality (Recommendation 7)

Thailand needs to define metropolitan areas to target the right pool of users of urban infrastructure. Accordingly, the NSO should define metropolitan areas to include not just the administrative boundaries of a city but also its neighbouring communities, to the extent that they belong to the same local labour market, as suggested by commuting patterns. These metropolitan areas therefore form integrated regions and include places where people live and work.

Northern cities are characterised by urban sprawl, with residents looking for cheaper housing, household incomes increasing and growing car ownership facilitating commuting. Redefinition of metropolitan areas could empower cities to deploy policies that target the preferences of individuals that reside in one administration and commute to the centre of business in another. For instance, the metropolitan area of Chiang Mai would extend beyond Chiang Mai city (thesaban) and include neighbourhoods in neighbouring Lampung province as well. Adjusting the target of urban policies thus requires a redefinition of urban areas in the North.

Box 2.7. The FUA methodology

The definition of FUAs in OECD countries uses population density to highlight urban cores and travel-to-work flows, in order to identify hinterlands where labour markets are highly integrated with the cores. The methodology consists of three main steps.

STEP 1. Identification of core municipalities through gridded population data

The first step of the methodology uses gridded population data to define urbanised areas or “urban high-density clusters” across the national territory, ignoring administrative borders, since urban cores are defined through gridded population data. The population grid data (1 km²) for Thailand would come from the Landscan project developed by Oak Ridge National Laboratory.

In most OECD countries, an urban core consists of a high-density cluster of contiguous grid cells of 1 km² with a density of at least 1 500 inhabitants per km². Different thresholds can be applied, depending on whether the metropolitan areas develop in a less compact manner. A municipality is defined as being part of an urban core if at least 50% of the population of the municipality lives within the urban cluster.

STEP 2. Connecting non-contiguous cores belonging to the same functional urban area

Urban cores as identified in Step 1 would normally approximate contiguous built-up surfaces. However, certain cities may develop in a polycentric way, hosting densely...
inhabited cores that are physically separated, but economically integrated. Using commuting data, the FUA methodology assesses the relationship between urban cores and the surrounding area, leading to the identification of urban areas with a polycentric structure.

In OECD countries, two urban cores are considered integrated (and thus part of the same polycentric metropolitan area) if more than 15% of the resident population of any of the cores commutes to work in the other core.

**STEP 3. Identification of the urban hinterlands**

The final step of the methodology consists of delineating the hinterland of the metropolitan areas. The “hinterland” can be defined as the “worker catchment area” of the urban labour market, outside the densely inhabited core. The size of the hinterland, relative to the size of the core, gives a clear indication of the influence of cities over surrounding areas. Urban hinterlands are defined as all municipalities with at least 15% of their employed residents working in a certain urban core.

*Source: OECD (2013), Definition of Functional Urban Areas (FUA) for the OECD metropolitan database, Mimeo.*

Urban policy in the North could be more effective if metropolitan areas were identified based on the “functional urban areas” (FUAs) methodology. FUAs combine satellite data with commuting patterns to define the urban area where people live and move on a regular basis (Box 2.7). Borders of FUAs thus overstep traditional administrative borders and the ensuing governance fragmentation (OECD, 2018[3]). The computation and definition of FUAs is standard across the world. Adopting FUAs would allow Northern cities to benchmark their performance with respect to social, economic and environmental indicators to leading global metropolitan areas.

**Table 2.4. Current statistical definition of urban areas underestimate the size, potential and issues of Northern cities**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Chiang Mai</td>
<td>Chiang Mai</td>
<td>493 149</td>
<td>174 235</td>
</tr>
<tr>
<td>Phitsanulok</td>
<td>Phitsanulok</td>
<td>165 001</td>
<td>89 480</td>
</tr>
<tr>
<td>Chiang Rai</td>
<td>Mae Sai</td>
<td>153 994*</td>
<td>n/a</td>
</tr>
<tr>
<td>Mae Sot</td>
<td>Tak</td>
<td>131 230*</td>
<td>52 350</td>
</tr>
<tr>
<td>Nakhon Sawan</td>
<td>Nakhon Sawan</td>
<td>95 821</td>
<td>95 237</td>
</tr>
<tr>
<td>Lampang</td>
<td>Lampang</td>
<td>85 299</td>
<td>69 226</td>
</tr>
<tr>
<td>Chiang Rai</td>
<td>Chiang Rai</td>
<td>83 166</td>
<td>64 817</td>
</tr>
<tr>
<td>Kam Phaeng Phet</td>
<td>Kam Phaeng Phet</td>
<td>72 315</td>
<td>31 192</td>
</tr>
</tbody>
</table>

*Note: * The population figures for Mae Sot, Tak, also include residents in the sister city of Myawadi, Myanmar. Given the uniform distribution of population density – adjusted by built-up area – as registered by the satellite, Tak and Myawadi can be considered as part of the same FUA. Similarly, Mae Sai forms an urban cluster with Wan Sa-te, in Myanmar.

*Source: Authors’ work based on the Global Human Settlement Layer, [https://ghsl.jrc.ec.europa.eu](https://ghsl.jrc.ec.europa.eu).*

Current statistical definitions of urban areas underestimate the size, potential and potential issues of Northern cities. The FUA methodology is not yet applicable in Thailand, because data on commuting patterns are not available. However, satellite data
alone can provide a sense of the actual size of Northern FUAs, their untapped potential and overlooked challenges (OECD, 2018[3]). Table 2.4 shows that the number of individuals living in cities (thesaban nakhon), as “traditionally” defined by the NSO, is systematically lower than the number of urban dwellers, as defined through the Global Human Settlement Layer (GHSL). The FUA of Chiang Mai is almost four times higher than that of Chiang Mai city alone.

Establish a metropolitan authority for Chiang Mai, then also for other Northern cities (Recommendation 8)

The definition of Functional Urban Areas goes hand-in-hand with the establishment of a metropolitan authority. By definition, FUAs extend beyond administrative borders, encompass several sub-provincial administrations (amphoe, tambon or muban), and may even overstep the border with neighbouring provinces. Northern cities can introduce “metropolitan authorities” that co-ordinate policies in the FUAs in order to achieve collective development objectives, integrate local labour markets and provide services that benefit all residents of the functional urban area. If local governments were left to pursue local policies in isolation, the well-being of FUAs’ residents might weaken.

Any metropolitan area needs at least an executive branch. The act that established the Greater London Authority in 1999 in the United Kingdom created the position of mayor of London and the London Assembly. Likewise, the creation of any FUA-type metropolitan authority in the North could go hand-in-hand with the introduction of a mayor in charge of urban policies in the area. Moreover, citizens should be able to elect their mayor, since local elections would strengthen the administrative leadership and enhance its political accountability to citizens – two prerequisites for effective urban policies (Diop, 2007[13]).

Experiment with participatory budgeting (Recommendation 9)

Participatory budgeting could be an additional mechanism to reinforce the political accountability of urban policies. It allows citizens to negotiate with the public administration over the municipality’s budgetary allocation and its investment priorities. In so doing, participatory budgeting improves the information that policy makers need to match closely citizens’ needs and preferences. Moreover, because of the bottom-up nature of the process, it forces mayors and local politicians to commit to citizens’ wishes. Participatory budgeting has thus improved local well-being in several emerging countries. For instance, in Brazil it contributed to reducing infant mortality rates and to strengthening local institutions (Gonçalves, 2014[14]).

Northern cities could also earmark local budget to projects that citizens select. Thailand has already experienced such forms of participatory budgeting. In the 1990s, the administration of Khon Kaen city together with local universities organised town hall meetings and focus groups to identify the problems, needs and priorities of citizens. Similarly, in Prachin Buri province, the Suan Mon Tambon Administrative Organisation organised civic committees that proposed and reviewed the composition of the budget (Fölscher, 2007[15]). Northern cities could explicitly dedicate a share of their budget to financing projects that enhance community well-being, selected through public consultation.

Participatory budgeting is not a silver bullet to improve local accountability and capacity. It requires progress in fiscal decentralisation reforms, the empowerment of local administrations and clarification of their fiscal responsibilities.
Inclusive and sustainable urban infrastructure (Expected result 4)

Create a transport authority for Chiang Mai, then also for other Northern cities (Recommendation 10)

Once defined, FUAs need efficient public transport to foster integration and improve citizens’ well-being. An efficient public transport system is fundamental to integrating local labour markets and to making people, goods and services move faster within the city. An efficient public transport system also would reduce the share of household budget spent on transport and cut commuting times. Shorter travel times to centres of business are normally associated with better socio-economic and health outcomes (Weiss et al., 2018[16]).

Northern cities need Transport Authorities. In Chiang Mai, for example, the co-existence of a multitude of micro-providers has jeopardised the reliability of public transport, and opened the way to the motorisation of the city. The existing public transport network does not always serve the suburbs, where more and more citizens are living. To address commuters’ preferences and behaviour, the Chiang Mai Transport Authority should cover the whole Chiang Mai FUA.

Five conditions are central to the successful creation of the Transport Authority of Chiang Mai and of any other Northern city in need. First, authorities should have the capacity to set integral mobility strategies. Second, institutional arrangements should be in place to co-ordinate land-use and housing strategies metropolitan-wide. Thirdly, financial and technical capacity should be developed internally. Fourthly, authorities should have legal authority and political support, and finally, once established, authorities should be able to deliver public value. Creating these conditions should be a priority in setting up a transport authority for Northern cities (OECD, 2016[17]). Table 2.5 summarises international experiences in meeting these five conditions.

**Table 2.5. Conditions to implement an effective transport authority**

<table>
<thead>
<tr>
<th>How</th>
<th>International examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Secure capacity to develop integral strategies</strong></td>
<td>The transport authority will need to have capacity to plan and manage public transport policies, investment and regulation at the metropolitan level, in order to implement effective transport demand management policies. Granting it authority and responsibility over walking and cycling policies, as well as over road safety and traffic management, should also be considered.</td>
</tr>
<tr>
<td></td>
<td>The TfL (London), the Urban Development Planning Authority Curitiba (URBS) (Curitiba) and the Land Transport Authority (LTA) (Singapore) have responsibility over all public transport modes, plus cycling and walking facilities. They also have capacity for setting transport demand management strategies, such as parking, road pricing schemes (e.g. congestion charges and low-emission zones [TfL and LTA]) and the vehicle quota system for controlling vehicle ownership (e.g. LTA). Both TfL and LTA have responsibility over road safety and freight regulation.</td>
</tr>
<tr>
<td><strong>Develop an institutional arrangement that guarantees integrated land use and transport planning</strong></td>
<td>The transport authority will need to be embedded in an institutional configuration in which long-term land-use planning and regulation at the metropolitan scale is guaranteed.</td>
</tr>
<tr>
<td></td>
<td>Transport planning by TfL is carried out within a wider metropolitan integrated planning framework, that co-ordinates with spatial and economic development strategies.</td>
</tr>
<tr>
<td></td>
<td>In Curitiba, close co-operation between the metropolitan authorities responsible for mobility (URBS) and land-use planning (Instituto de Pesquisa e Planejamento Urbano de Curitiba [IPPUC]) has been key to the creation of the Integrated Transport Network and its development within a transit-oriented development scheme.</td>
</tr>
</tbody>
</table>
Key actions to that end include:
1) Prioritise investment and road space for walking, cycling and public transport
2) Increase efforts to improve transport planning and data collection
3) Develop a well-integrated transport network
4) Implement transport demand management policies and effective vehicle regulation
5) Adopt a “safe-system approach” for improving road safety – that is, a holistic and proactive approach, managed so that the elements of the road transport system combine and interact to guide users to act safely.

Source: (OECD, 2016[7]).
Chiang Mai and the other Northern cities could dynamically assess commuters’ behaviour and adapt the scale and scope of the Transport Authority accordingly through regular surveys. As of today, the availability of mobility data is very limited. Population censuses in OECD countries usually provide useful insights; this is not the case in Thailand. The lack of similar data is an obstacle to the definition of FUAs and to the design of informed urban mobility policies. The Chiang Mai Mobility and Transport Survey (CM-MTS) is one of the few existing household travel surveys. It collects information about 19,385 surveys carried out by 6,189 persons in 2,319 households within the Chiang Mai city area between 2011 and 2012. These data provide a comprehensive snapshot of the travel behaviour of the city’s residents (Jittrapirom and Emberger, 2013[18]). Northern cities could implement similar surveys, update them regularly and extend them to the residents of the FUAs to capture the actual commuters’ needs.

Build a data system to monitor the quality of urban infrastructure (Recommendation 11)

In addition to an efficient transport network, access to and quality of services such as water, sanitation and electricity are fundamental for citizen’s well-being and quality of life.

Tailor-made and granular household surveys could help to assess the access to and quality of urban infrastructure in Northern cities. Northern cities could pilot surveys that are representative at the sub-provincial level and that evaluate the quality of (and access to) urban services. The “Basic needs survey” conducted by the Department of Community Development, under the Ministry of Interior, already measures the quantity of clean water that is daily available. It also could measure, for example, the frequency and length of power outages in urban dwellings. Night light data and remote sensing data could complement traditional sources of data for improved poverty prediction and mapping at the neighbourhood level.

Universities and colleges become key drivers of regional development

Universities promote entrepreneurship education (Expected result 5)

Integrate technical education with entrepreneurship education (Recommendation 12)

Entrepreneurship requires people with an entrepreneurial mindset and the skills to run and grow a firm. Northern entrepreneurs are generally satisfied with the knowledge that students develop in class. However, they find that fresh graduates lack the motivation, attitude and self-confidence to “run the extra mile”, innovate and thus create value.

Northern universities could provide the future entrepreneurs of the region with the right mix of hard and soft skills. Traditional coursework focuses on developing the hard skills needed to run a business, such as business administration knowledge, marketing, financing and accounting. Students could spend more time developing soft skills and overall entrepreneurial attitude. By pooling resources and teaching staff from all types of universities, local schools could introduce courses that train students with technical skills and simultaneously create an entrepreneurial mind-set.
Create incentives and space for universities’ autonomous initiatives (Recommendation 13)

Northern universities could assign a member of their top-level management exclusively to the development of entrepreneurship education. This manager should be responsible for definition of the overall goal of the entrepreneurship education programme, the degree of curricular integration, resource allocation, research, evaluation, and enhancement of the role of entrepreneurship in research and teaching. The creation of this management position requires universities to enjoy a certain degree of autonomy from the Ministry of Education.

Entrepreneurship programmes need to be dynamic and take into account research and real business needs. Universities could organise performance assessments on a regular basis by seeking feedback from local entrepreneurs, alumni entrepreneurs and students. Schools could, moreover, track and survey alumni with entrepreneurial careers. In order to internalise this feedback and adapt coursework accordingly, universities will ultimately need a measure of autonomy from the Ministry of Education.

Innovative and interactive pedagogic methods can indirectly develop entrepreneurial skills, attitudes and behaviours. Schools and teaching staff could complement traditional lecturing with more innovative teaching methods, such as video and online assignments, problem-based learning and project work on real technologies. These methods make students more responsible and critical about what they learn, and create space for co-operative and collective learning. Self-organisation, critical thinking and co-operation are all distinct traits of successful entrepreneurs.

Universities support entrepreneurship (Expected result 6)

Create networks of universities and private sector to support SMEs and start-ups (Recommendation 14)

Universities in selected Northern provinces already support local entrepreneurship and innovation. Some of them help reduce the cost of establishing new companies by providing legal assistance and facilitating access to credit. Others train and mentor existing local entrepreneurs in order to strengthen their managerial skills and support the development of their products. For example, the Chiang Mai University and its Science and Technology Park functions as a successful incubator of local start-ups in the agricultural and pharmaceutical sector. The “Business Incubation Unit” of the Mae Fah Luang University has helped establishing local business for processing agricultural products. Rajabhat and Rajamangala universities reach out to entrepreneurs in local communities and support the development of new ideas and local business.

Northern universities need an integrated approach to the development of local business. The strategies to support local entrepreneurship of global and local universities seem to be disconnected. In order to further contribute to the regional entrepreneurial ecosystem, the Chiang Mai University, the Mae Fah Luang University, the Rajamangala and Rajabhat universities could create a network to share their respective complementary know-how, assets and skills, and reach.
The North should create an Institute for Entrepreneurship and SMEs, following the lead of successful OECD experiences. By combining the know-how of both global and applied universities, the institute would guarantee the integration of both hands-on and theoretical entrepreneurship education in the curricula. The institute mission does not require a large staff, but rather a simple and dynamic structure that easily adapts to the local context. In terms of budget, the effort would therefore be limited and local and central government, together with the local chapters of Federation of Thai industries and Chambers of Commerce, could contribute. Looking at OECD experiences could help Northern authorities set up the institute. For instance, in 2006 the region of Brandenburg, Germany funded an entrepreneurship institute gathering nine public universities and the regional development agency. The institute has only eight employees and an annual budget of EUR 100,000, financed by the European Structural Funds, the Ministry of Economics of Brandenburg and project-related fees for services. Each partner organisation runs additional projects and employs supplementary personnel according to project needs.

Alongside the Institute for Entrepreneurship, the North needs new ways to forge alliances between universities and the private sector. Northern universities and enterprises could create Centres of Excellence to encourage the development of research with a high potential for commercial application. These Centres enable knowledge transfer by facilitating collaboration between enterprises and research institutions – including both global and local universities. To establish provincial or regional Centres of Excellence, the North could draw on best practices from OECD countries, such as Austria (Box 2.8).

---

**Box 2.8. The Christian Doppler Research Association, Austria: A role model for university-business co-operation in OECD countries**

**History, mission and performance of the Christian Doppler Research Association (CDRA)**

In 1989, Austria established the Christian Doppler (CD) Research Association as a Centre of Excellence to support knowledge transfer and co-operation between science and industry. The Association envisages the establishment of temporary laboratories at universities that work on “application-oriented fundamental research”.

Since the founding of the Research Association, the number of CD Laboratories and involved commercial partners has grown constantly. In 2017, 148 companies were involved in 87 CD Laboratories. In comparison, in 2016, 136 companies collaborated in 81 labs. The overall expenditure of the research units amounted to EUR 26.2 million in 2017, compared to EUR 24 million in 2016.

The CD labs are divided into eight different thematic clusters and employ around 630 scientific staff.

Both industry partners and research partners seemed satisfied with the outcomes of the CD labs. During the 2012 and 2017 evaluations, industry partners acknowledged the opportunities the CD programme provided to obtain continuous access to cutting-edge research and innovation. They praised programme management for its efficiency, transparency and flexibility. The CD association also enjoys a strong academic reputation. In 2017, the scientific output of researchers in CD labs amounted to 469 publications (including 371 peer-reviewed publications), 1,061 presentations at conferences and 4 granted patents.
Figure 2.6. Measuring the performance of the Christian Doppler Labs

Panel A. CDG laboratories by thematic clusters, 2017

<table>
<thead>
<tr>
<th>Thematic Cluster</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry</td>
<td>9</td>
</tr>
<tr>
<td>Economics, Law and Social Sciences</td>
<td>2</td>
</tr>
<tr>
<td>Life Sciences and Environment</td>
<td>16</td>
</tr>
<tr>
<td>Mathematics, Computer Sciences, Electronics</td>
<td>17</td>
</tr>
<tr>
<td>Mechanical Engineering and Instrumentalisation</td>
<td>6</td>
</tr>
<tr>
<td>Medicine</td>
<td>15</td>
</tr>
<tr>
<td>Metals and Alloys</td>
<td>8</td>
</tr>
<tr>
<td>Non-metallic materials</td>
<td>4</td>
</tr>
</tbody>
</table>

Panel B. Scientists in the CDG laboratories by thematic clusters, 2017

<table>
<thead>
<tr>
<th>Thematic Cluster</th>
<th>Postdocs/Senior postdocs</th>
<th>Doctoral students</th>
<th>Graduands</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry</td>
<td>29</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Economics, Law and Social Sciences</td>
<td>17</td>
<td>36</td>
<td>27</td>
</tr>
<tr>
<td>Life Sciences and Environment</td>
<td>20</td>
<td>39</td>
<td>10</td>
</tr>
<tr>
<td>Mathematics, Computer Sciences, Electronics</td>
<td>16</td>
<td>29</td>
<td>18</td>
</tr>
<tr>
<td>Mechanical Engineering and Instrumentalisation</td>
<td>25</td>
<td>77</td>
<td>29</td>
</tr>
<tr>
<td>Medicine</td>
<td>40</td>
<td>59</td>
<td>21</td>
</tr>
<tr>
<td>Metals and Alloys</td>
<td>17</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>Non-metallic materials</td>
<td>28</td>
<td>38</td>
<td>38</td>
</tr>
</tbody>
</table>


StatLink 2 http://dx.doi.org/10.1787/888933949326

Eight key reasons that make CD labs a role model:

1. **Integration into the scientific environment of universities and non-university research institutions.** The structure of CD labs limits administrative costs and extra red tape.

2. **Bottom-up orientation.** Laboratories are set up as initiatives of one or more companies. The business partner not only founds the lab, it also defines its focus and shapes its rules and processes.

3. **Rigorous scientific quality monitoring.** Interested companies apply with a research plan that is then refined by relevant universities. The CD Association’s management and international peers review the applications and select the most promising and financially viable.

4. **Maximum duration of seven years.** The performance of the labs is evaluated after two years. If the interim evaluation is positive, the contract is prolonged for a maximum of five more years.

5. **Compact research groups and strong leadership** (5-15 people). The Head of the Laboratory enjoys significant autonomy with respect to the management of researchers and the lab’s research agenda.

6. **Guaranteed scientists’ freedom of initiative.** Researchers spend 70% of their time on company-specific research and the remainder on other relevant research. By engaging with the business sector, scientific partners receive resources to
promote the careers of young scientists.

7. **Joint financing by the public purse and companies.** Company-partners contribute 50% of the lab’s budget (40% in the case of SMEs). All financial support take the form of funds; in-kind services are not considered. The public sector covers the remainder of the budget.

8. **International involvement.** One of the two participants in the initiative – either the scientific partner or the commercial partner – has to be Austrian.


**The Action Plan: A summary**

**Table 2.6. An effective strategy and strong LAOs drive the development of the North: Action plan**

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Action</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Expected result 1: Create a strategy for developing the Northern Region, building on local discovery</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Smart Labs for entrepreneurial discovery of business and innovation potential (1) | • Organise Smart Labs with selected representatives of local entrepreneurs and the local public administration.  
• Complement the Smart Labs with innovation mapping and crowdsourcing tools. | NESDC, NSO, local universities and selected stakeholders taking part in the Smart Labs. |
| Support strategy process with analysis of product and innovation data, as well as crowdsourcing (2) | Apply product space methodology to the most detailed level of production to identify the current and potential strengths of each province. | NESDC, NSO, local universities |
| Define optimal provincial clusters to target smart labs and the development strategy (3) | Cluster contiguous provinces based on their Human Achievement Index, balancing indicators measuring current and future capabilities. | OECD, NESDC |
| **Expected result 2: Strengthen LAOs in the Northern Region – experiment with innovation in tax collection and transfers** | | |
| Test innovative methods for property tax collection to increase LAO revenues (4) | • Strengthen the tax base for the building and land tax by updating property values that are currently outdated.  
• Build a collaborative and transparent cadastral database. | Department of Land Administration, Valuers Association of Thailand, Geo-Informatics and Space Technology Development Agency (GISTDA) |
| Invest in local capacity building and peer learning for improved local fiscal capacity (5) | • Create incentives for local administrators to constantly improve their administrative skills.  
• Earmark annual budget for staff and official training, and allot time for the pursuit of continuing education.  
• Create a “Northern Municipal League” for mayors and local administrators to meet regularly and learn from each other’s challenges and solutions regarding fiscal capacity. | Department of Land Administration, Department of Community Development |
| Experiment with a simplified but more effective system of transfers (6) | General grants:  
• Test new formulas based on the experience of Italy and Japan  
• Increase the weight of general grants in the system.  
• Revise the allocative formula to ensure equalisation of fiscal capacity and service costs across provinces. | Office of the Prime Ministry, Ministry of Interior (Department of Community Development), NESDC regional office |
| Conditional grants: | • Experiment with results-based conditional grants based on the achievement of targets that are negotiated among representatives of the central government, local government and local stakeholders. The NESDC could help supervise the negotiation. | |

MULTI-DIMENSIONAL REVIEW OF THAILAND © OECD 2019
**Table 2.7. Action plan to transform Northern cities into drivers of regional development**

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Action</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>Re-define metropolitan areas based on functionality (7)</td>
<td>- Apply the OECD methodology of Functional Urban Areas (FUA) by combining GIS data and commuting data.</td>
<td>NSO, GISTDA</td>
</tr>
<tr>
<td>Establish a metropolitan authority for Chiang Mai, then also for other Northern cities (8)</td>
<td>- Establish a Metropolitan Area that encompasses all subnational authorities within the FUA. - Institutionalise the mayor of the Metropolitan Area, elected by residents.</td>
<td>Office of the Prime Minister, Ministry of Interior (Office of the Minister, Department of Community Development)</td>
</tr>
<tr>
<td>Experiment with participatory budgeting (9)</td>
<td>- Set a share of the local budget to finance projects that have been submitted and voted by local citizens.</td>
<td>Ministry of Interior, Ministry of Treasury, Ministry of Community Development</td>
</tr>
</tbody>
</table>

**Expected result 3: Re-organise urban policies for performance and accountability**

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Action</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create a transport authority for Chiang Mai, then also for other Northern cities (10)</td>
<td>- Secure capacity to develop integral strategies. - Develop an institutional arrangement that guarantees integrated land use and transport planning. - Build internal financial and technical capacity. - Gain legal authority and political support. - Ensure delivery of public value.</td>
<td>NESDC should harmonise the nine existing transport plans envisaged by the NESDP by involving all the relevant agencies at the central and regional level (e.g. Ministry of Energy, Ministry of Transport, Metropolitan Waterworks Authorities)</td>
</tr>
<tr>
<td>Build a data system to monitor the quality of urban infrastructure (11)</td>
<td>- Design granular household surveys that help assess access to and the quality of urban infrastructure in Northern cities. - Use night light data and remote sensing data to improve poverty prediction and mapping at the neighbourhood level.</td>
<td>NSO, GISTDA, Ministry of Interior (Department of Community Development)</td>
</tr>
</tbody>
</table>

**Expected result 4: Inclusive and sustainable urban infrastructure**

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Action</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrate technical education with entrepreneurship education (12)</td>
<td>Provide the right mix of hard and soft skills by ensuring constant contact between students and entrepreneurs, and by pooling resources and staff from all types of local universities (global universities, rajabhat and rajamangala).</td>
<td>Chiang Mai University, Chiang Rai University, rajabhat and rajamangala, Ministry of Education, Thai Federation of Industries, local Chamber of Commerce.</td>
</tr>
<tr>
<td>Create incentives and space for universities’ autonomous initiative (13)</td>
<td>- Northern universities could assign a member of top-level management exclusively to the development of entrepreneurship education. - Periodically seek feedback from students, alumni and local entrepreneurs.</td>
<td>Chiang Mai University, Chiang Rai University, rajabhat and rajamangala, Thai Federation of Industries, local Chamber of Commerce, alumni associations and students associations.</td>
</tr>
</tbody>
</table>

**Expected result 5: Universities promote entrepreneurship education**

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Action</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create networks of universities and private sector to support SMEs and start-ups (14)</td>
<td>Establish an Institute for Entrepreneurship and SMEs of the North including all regional universities and co-ordinated by the regional NESDC office and the Ministry of Interior. - The institute should build strong linkages between universities and the start-up world. - Provide services such as the evaluation of entrepreneurial potential, mentoring and coaching, and financial and legal advice.</td>
<td>Chiang Mai University, Chiang Rai University, rajabhat and rajamangala, Thai Federation of Industries, local Chamber of Commerce.</td>
</tr>
<tr>
<td>Create incentives for companies and universities to rapidly</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 2.8. Action plan for Northern universities and colleges to become key drivers of regional development**

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Action</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide the right mix of hard and soft skills by ensuring constant contact between students and entrepreneurs, and by pooling resources and staff from all types of local universities (global universities, rajabhat and rajamangala).</td>
<td>Chiang Mai University, Chiang Rai University, rajabhat and rajamangala, Ministry of Education, Thai Federation of Industries, local Chamber of Commerce.</td>
<td></td>
</tr>
<tr>
<td>Northern universities could assign a member of top-level management exclusively to the development of entrepreneurship education. - Periodically seek feedback from students, alumni and local entrepreneurs.</td>
<td>Chiang Mai University, Chiang Rai University, rajabhat and rajamangala, Thai Federation of Industries, local Chamber of Commerce, alumni associations and students associations.</td>
<td></td>
</tr>
</tbody>
</table>

| Create incentives for companies and universities to rapidly | | |
constitute laboratories of research. Following the successful experience of Austria, these labs could have the following characteristics:

- Physical integration with the academic world.
- Bottom-up orientation.
- Rigorous scientific quality monitoring.
- Set maximum duration of the lab project.
- Compact research groups and strong leadership.
- Guaranteed scientific freedom for the scientists.
- Joint financing by the public purse and companies.
- International involvement.

Notes

1 These figures relate to 2015 and are based on the Human Achievement Indicators.

References


CHAPTER 2. DEVELOPING THE POTENTIAL OF THAILAND’S NORTH: AN ACTION PLAN


Jittrapirom, P. (2015), An analysis of Chiang Mai city’s transport system and its path towards sustainability, with a focus on the role of the motorcycle and the shared-taxi, Vienna University of Technology.


Annex 2.A. Robustness test for the outcome of the Max-p clustering method

Annex Figure 2.A.1. The configuration of Max-p regions does not change significantly as the population threshold decreases.

Note: Bold lines indicate current regional borders, while thinner lines are the current provincial borders. The Max-p clustering method identifies seventeen regions in total that contains at least 4% of the overall population. Each region has been assigned a unique pattern. Source: Authors’ work based on data provided by the NESDC.
Annex 2.B. Operationalising the product space methodology at the subnational level

Operationalisation of the product space relies on micro-data on firms’ production. The product space methodology is founded on the concept of “revealed comparative advantage” (RCA), which is normally based on trade data. Since trade data are not available at the subnational level, data on industrial production could be used as an alternative to identify the comparatively advantageous sectors in each province. For instance, industrial censuses provide all the firm-level information needed to compute the net value added (VA) per sector.

Provinces would identify the subsectors in which they are already specialising by identifying their RCA. A province \( p \) has a comparative advantage in sector \( s \) if the VA produced in this sector relative to the overall provincial VA is larger than the relative VA in sector \( s \) in the rest of the country. Formally,

\[
RCA_{p,s} = \frac{VA_{p,s}}{\sum_s VA_{p,s}} / \frac{VA_{THA,s}}{\sum_s VA_{THA,s}}
\]

Where the numerator is the aggregate firm’s net value added (computed at the provincial level) from producing goods in sector \( s \); the denominator is the same relative net value added, but computed at the country level. A province \( p \) has a revealed comparative advantage in sector \( s \) if \( RCA_{p,s} > 1 \).

Based only on manufacturing data from the Industrial Census 2017, Northern provinces have a comparative advantage in 73 subsectors, on average. The region has the highest revealed comparative advantage in the manufacturing of cork, straw and plaiting materials: the relative RCA is almost 20 times higher than in the other provinces. RCA is particularly high for the regional sugar industry, manufacturing of steam generators, maintenance and repair of office, accounting and computing machinery, malt liquors and grain mill products (Annex Table 2.B.1).

Annex Table 2.B.1. Top 10% sectors by RCA with significant average share of provincial manufacturing value added

<table>
<thead>
<tr>
<th>ISIC 4 digits</th>
<th>ISIC 4 digits – Description</th>
<th>ISIC 2 digits</th>
<th>RCA (2017)</th>
<th>Average share of provincial manufacturing value added (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1542</td>
<td>Sugar</td>
<td>Food and beverages</td>
<td>16.7</td>
<td>16.6</td>
</tr>
<tr>
<td>1553</td>
<td>Malt liquors and malt</td>
<td>Food and beverages</td>
<td>13.3</td>
<td>12.7</td>
</tr>
<tr>
<td>1531</td>
<td>Grain mill products</td>
<td>Food and beverages</td>
<td>12.8</td>
<td>10.5</td>
</tr>
<tr>
<td>2694</td>
<td>Cement, lime and plaster</td>
<td>Non-metallic mineral products</td>
<td>6.9</td>
<td>4.7</td>
</tr>
</tbody>
</table>

Source: Authors’ work based on Industrial Census 2017.
Moving forward, a province $p$ would identify the sectors in which it can further specialise given its current capabilities. Such proximity is calculated by comparing how many provinces that specialise in sector $s$ also specialise in sector $h$. The higher this number, the more likely it is that sector $s$ and $h$ share common capabilities. Sector $h$ is therefore worthy of consideration for the specialisation process.

Formally,

$$\varphi_{p,s-h} = \min\{P(RCA_{p,s} > 1|RCA_{p,h} > 1), P(RCA_{p,h} > 1|RCA_{p,s} > 1)\}$$

Where $P(RCA_{s} > 1|RCA_{h} > 1)$ is the probability that a province specialises in sector $h$ given that it also specialises in sector $s$ – or, the proximity. For example, if 10 provinces in Thailand specialise in sector $s$, and 5 out of those 10 provinces also specialise in sector $h$, then the proximity (or the general likelihood of specialisation) for sector $h$ in relation to product $s$ is 0.5.
Chapter 3. Towards better management of water security in Thailand’s Northern Region

The Northern Region of Thailand contains 17 individual provinces each of which presents unique challenges with regard to water management. Expansion of the tourism sector in Chiang Mai is linked to issues of water quality, growth in the agricultural and manufacturing sectors in Tak presents difficulties related to water allocation, and seasonal variations in precipitation are at the root cause of low water levels in the Mekong River Basin that impact navigation and export opportunities in Chiang Rai.

Tackling these varied water management challenges requires a strong vision and water strategy on the part of central government as well as empowered local actors to deliver against their mandate. This chapter presents policy recommendations that intend to improve organisation, policy coherence and decision making, and take a long-term, risk-based approach to infrastructure development and water security.
The Northern Region: Context, challenges and opportunities for water management

The Northern Region of Thailand consists of 17 provinces each of which has its own pressures, challenges and opportunities with regard to water management and long-term water security. Northern Thailand borders Myanmar to the west, Lao PDR to the north, and is bound by the Salween river in the west and the Mekong river in the north and east. The terrain is mountainous and the climate is tropical although the high elevation contributes to cooler winters than the other regions, influencing the types of agricultural produce that can flourish.

The Northern provinces are blessed with considerable natural water resources. Rivers including the Ping, Wang, Yom and Nan flow southwards through the North and merge in Nakhon Sawan province to form the Chao Phraya river. Two large dams, the Sirikit Dam on the Nan river in Uttaradit province and the Bhumibol Dam in Tak province, serve multi-purpose applications including water storage, irrigation supply, hydroelectric power production, flood control, fisheries and saltwater intrusion management (EGAT, 2013[1]).

The Ping river basin is the major watershed in northern Thailand. The Ping river originates at Doi Thuai in the Daen Lao Range located in Chiang Dao district, Chiang Mai province. After passing Chiang Mai it flows through the provinces of Lamphun, Tak and Kamphaeng Phet. The Ping river can be divided into upper, middle and lower sections: the upper Ping refers to the northern section around Chiang Mai, the middle Ping to the part flowing through Tak province and the Lower Ping to the southernmost section in Nakhon Sawan province.

The Ping supports a range of economic activities as it flows from north to south. The upper Ping serves a large population and a growing tourism industry around Chiang Mai. The climate and topography in the local region favour fruit tree production including the longan industry in the inter-montane Chiang Mai-Lamphun Valley, and plantings of mango, litchi and a range of other crops, which are often planted in mixed orchards. A substantial citrus industry has also emerged in the far northwest corner of the Ping basin, while strawberry production has gained in importance at higher elevations. In upper basin provinces, notably the mountainous areas of Chiang Mai, there are coffee and tea plantations; these produce both Chinese types of tea and incorporate “miang” tea gardens, which are traditionally planted in natural forests. In contrast, the lower Ping basin provinces have extensive irrigated areas that are used to produce multiple crops of paddy rice (Thomas, 2005[2]).

The North is home to three other river basins. The Kok river basin, located adjacent to the Ping river basin, is the catchment area for the Kok river, which supports significant irrigation activity in Chiang Rai province and functions as a tributary of the Mekong. The Wang river basin is the catchment area for the Wang river, which originates in Chiang Rai province and joins the Ping river in the northern part of Tak province; it supports irrigation activity as well as the transport and trading town of Lampang, the third largest town in northern Thailand. The Yom river basin is the catchment area for the Yom river, which originates in Phayao province and flows through Phrae and Sukhothai provinces, where it represents the main water resource, before joining the Nan river at Nakhon Sawan province.

Water management in the North affects Thailand as a whole. The main rivers in the North merge as they flow southward to form the Chao Phraya, the country’s major river; thus, river basin management upstream has significant downstream impacts in terms of water
Clear vision and organisation empower regional actors to deliver their water management responsibilities (ER1)

The national strategy is structured to empower development of localised and prioritised regional strategies (1)

Clarity over roles, responsibilities and reporting requirements should be ensured (2)

Position the National Water Resources Committee (NWRC) as the multi-stakeholder platform for decision making on water management issues (3)

The role and responsibilities of River Basin Management Organisations must be clear and add value (4)

Adoption of a risk management approach to water security

Data must be centralised and include information on floods, droughts, water supply and demand, and water quality (5)

The level of risk and priorities should be identified at the national and regional level (6)

A revised list of policy tools should be deployed to achieve national and regional objectives (7)

Information must be used to inform decision making, prioritise compliance and enforcement activities, water allocation and infrastructure priorities (8)

Appropriate infrastructure solutions are selected with adequate capital and O&M budgets allocated (ER3)

A robust financial plan should be developed and aligned with delivery of the strategic plan (9)

Infrastructure solutions should be appropriate for the regional context, aligned with land use planning and embed innovation and long-term climate change thinking (10)

Note: This figure refers to the Recommendations and Action Plan presented at the end of this report. “ER 1” stands for the main expected result and bracketed numbers to Action Plan recommendations.

Source: Authors’ own work.

A scorecard in Chapter 4 proposes a series of indicators to monitor implementation and the impact of the actions proposed in the Plan. The indicators are adapted from the OECD Water Governance Indicators and will monitor implementation of the framework and governance following the adoption of a risk management approach to water security (OECD, 2018[3]). Over the longer term, observable benefits are expected in terms of a reduction in the impacts of floods and droughts and the performance of the wastewater sector and associated pollution. Visible benefits are also expected with regard to progress against the water-related Sustainable Development Goals (SDGs) and their associated indicators, as well as in terms of the practical implementation of integrated water resources management (IWRM). While these indicators are typically used at the national
level, experts consider that the Northern Region of Thailand would also benefit from tracking progress against them (CRED, 2009; FAO, 2016).

**Clear vision and organisation empower regional actors to deliver their water management responsibilities**

A significant number of central and regional actors are involved in water management in Thailand, leading to concerns over conflicting organisational mandates and a disconnect between central policy making and regional implementation. The move towards practical implementation of IWRM principals is ongoing and requires strengthening.

Since the second volume of the Multi-dimensional Review (OECD, 2019) was completed, Thailand has made progress with regard to its new Water Resource Act, which was announced in the Government Gazette on 28 December 2018, and the relaunch of the National Water Resources Committee (NWRC). Interviews conducted during the preparation of this report indicated a widespread optimism that the newly launched NWRC has provided an opportunity to address previous water management challenges.

The key to addressing these challenges will be clear leadership, a strong vision and the empowerment of local actors to deliver against their mandate. The government must complete four key tasks to achieve these objectives.

**The national strategy is structured to empower the development of localised and prioritised regional strategies (Recommendation 1)**

A national strategy must set the vision and guiding principles for the water sector but should not be overly prescriptive in terms of content. Regional and local authorities and actors must be empowered to develop local capacity and to use their local knowledge to prioritise and implement action. The national strategy should present the framework and guiding principles to underpin this approach, rather than concerning itself with the details.

The national strategy would also set out the fiscal relationships between central and regional administrations; this may include conditionalities and other tools to monitor progress towards delivery of the central vision in the provinces.

To develop and deliver local and regional strategies, local actors must be empowered to perform against their mandates. A key task in this regard will be determining water management priorities at the local and regional level that reflect the unique characteristics of each province in the Northern Region. These priorities would be identified in line with guiding principles set by the national strategy. Local and regional authorities would report on their progress to central authorities, allowing them to measure overall progress with confidence against delivery of the strategy.

**Clarity over roles, responsibilities and reporting requirements should be ensured (Recommendation 2)**

There is clear concern within Thailand’s water sector regarding the overlap of mandates of various actors. This includes activities such as the issuing of permits, inspections, data collection, and reporting both locally and nationally. To address this issue, Northern water authorities could map sector roles and responsibilities against the requirements of the national strategy, vision and prevailing legislation. This exercise would identify existing overlaps and also gaps with regard to policy, objectives, information and
capacity (OECD, 2012[7]). An action plan should then be developed to address the overlaps and close the gaps. The findings of this mapping exercise must be well communicated from the central administration and executed at the local level. In particular, better co-ordination and clarity over roles and responsibilities with regard to disaster preparation and recovery should be revisited and would be expected to include collection and ownership of data and information sharing and reporting.

The mapping exercise should clearly identify owners of strategy development, policy making and long-term planning. To ensure that strategies are robust and that the opportunity for implementation is realistic, budget cycles must be aligned to long-term strategic plans, including infrastructure requirements.

Each entity should be responsible for raising awareness of water security issues across all sectors and society. The entity’s area of influence should include topics such as water use efficiency and disaster preparation and recovery, and would aim to engage society as a whole in tackling water security challenges.

**Position the National Water Resources Committee (NWRC) as the multi-stakeholder platform for decision making on water issues (Recommendation 3)**

There is significant optimism in Thailand regarding the potential impact of the revised structure and launch of the National Water Resources Committee (NWRC). The NWRC will be supported by the new Water Act and has the potential to capitalise on growing public enthusiasm for initiatives to address water management challenges.

To be successful, the Committee should enjoy high-level political support and ownership and must have a clear remit in terms of decision making and strategic direction. Thailand should also ensure that the Committee has the correct representation including from relevant ministries, river basin committees and the wastewater sector.

To harness the current optimism around the Committee, it should commit to meet regularly and to keep complete and transparent records of meetings and action lists. The Committee’s meeting agendas should be bold and ensure that cross-sectorial issues are captured, for example by maintaining the link between water management and economic development.

The Committee must remain a high-level decision-making body and should resist the temptation to be drawn into the minutiae of day-to-day operations. Regional and National Policy Dialogues should be established and used to inform the NWRC through evidence-based analysis and preparation of policy recommendations. These Dialogues would be established at a more technical level and would deliver projects to establish the evidence base to support strategy and policy decisions. They would also be used to provide a platform for consultation on issues ahead of presentation to the high-level committee. For example, a Regional Policy Dialogue for the North could be established to allow detailed discussion on critical water management issues typical to this region.

**Box 3.1. National Policy Dialogues as a process**

National Policy Dialogues (NPDs) on water are the main operational instrument of the European Union Water Initiative (EUWI) component for Eastern Europe, the Caucasus and Central Asia.

NPDs are policy platforms where stakeholders meet to advance water policy reforms.
The role and responsibilities of River Basin Management Organisations must be clear and add value (Recommendation 4)

Thailand has invested significant effort in defining river basins and establishing River Basin Management Organisations. Participants at the workshop “Toward Better Management of Water Security” in Chiang Mai on 30 November 2018 considered that these structures are not currently fulfilling their potential, with possible root causes being a lack of human and technical capacity, insufficient funds and lack of authority. The North could benchmark the current role and performance of River Basin Management Organisations against international practice and the strategy and vision for the sector in Thailand.

This benchmarking exercise should aim to determine how River Basin Management Organisations could support the overall management of water resources including their potential roles in stakeholder management, data collection, infrastructure specification, planning and forecasting, and charging for services.
Following this benchmarking exercise, there is an opportunity to provide clear guidance on the roles, mandates and expectations of these organisations. Thailand should take into consideration the fact that some river basin committees may have stronger capacity and add more immediate value to the sector than others. Some organisations might also be of more strategic importance than others and may therefore constitute a greater priority for investment. For example, the Ping River Basin Authority contains Bhumibol Dam, the largest dam in Thailand, which has a major impact on the local economy and water distribution as well as a significant part of Thailand, as the Ping ultimately discharges into the Chao Phraya river. Thailand should consider strengthening the remit of one of these key River Basin Management Organisations to become a pioneer management structure and set the scene for the future development of others.

Robust, evidence-based decision making and policy frameworks prioritise regional action

Making evidence-based decisions is key to the development of a successful water sector. Thailand presently collects data in silos and during the MDCR Volume II and III workshops presented only limited evidence of data being shared between key agencies and analysed to produce the information necessary to support decision making. The launch of a new strategy and greater clarity over roles and responsibilities in the agencies concerned will provide an opportunity to revisit the way in which data are collected and used to update the policy framework. Evidence-based decision making builds trust and represents an opportunity for regional administrations to demonstrate capacity to central government and to secure autonomy.

Data must be centralised and include information on floods, droughts, water supply and demand, and water quality (Recommendation 5)

Collection and analysis of data is costly and time consuming, and it is important for any administration to be able to identify both the minimum and optimum level of data required and the necessary frequency. It must then ensure that sufficient resources are allocated to collect and analyse the data, and store, share and use them as required. The North could become a pioneer with regard to the establishment of regional databases that are centrally accessible to concerned stakeholders, bearing in mind that data may be collected on a river basin level rather than a province level. The data required should, as a minimum, allow for the delivery of objectives as envisaged in the strategy and inform policy development and implementation. Therefore, key water security indicators for floods, droughts, pollution and water quality, and water supply and demand should be included. Furthermore, provincial, regional or basin databases should be accessible and/or feed into a national overview of water management and water security.

The level of risk and priorities should be identified at the national and regional level (Recommendation 6)

To move towards a risk-based approach to water security, administrations should prioritise actions. Local authorities are best placed to calculate and assign the risk and priority based on local knowledge and experience. This prioritisation should be embedded in the guiding principles that form part of the national strategy and policy framework. The provinces in the North could create and maintain a set of provincial and regional priorities for water security action that include, as a minimum, priorities for flood protection, water allocation and pollution control.
A flexible approach to risk management could facilitate the prioritisation exercise. This would be achieved by incorporating regular review processes to reflect the latest thinking and information on acceptable risk.

The regional risk prioritisation exercise would feed into and support a national risk-based prioritisation of action. The National Water Resources Committee, supported by high-quality analysis and data, could confirm levels of acceptable risk that are transparent to all relevant actors. This activity must recognise that acceptable risk is likely to be different for different regions and for different sectors.

**A revised list of policy tools should be deployed to achieve national and regional objectives (Recommendation 7)**

As a pioneer for the whole of Thailand, the Northern Region should conduct an inventory of the regulatory, economic and information-based tools currently in use. This would be expected to include tools such as flood insurance schemes, water quality standards and flood zone maps. Participants at the workshop “Toward Better Management of Water Security” in Chiang Mai on 30 November 2018 shared concern over the performance and enforcement of existing tools, particularly those that required monitoring to support enforcement, for example, water allocation and water quality regulations.

Once the inventory is created, the performance of policy tools should be assessed against the strategic objectives of the sector. Trade-offs, gaps and poor-performing tools should be identified and marked for reform. The inventory should be benchmarked against the strategic objectives of the sector and the national and international tools available, and then updated to create a new policy framework. The tools should be deployed as required and supported by investment in the necessary human capital and resources to aid implementation (OECD, 2013[9]).

**Information must be used to inform decision making, and prioritise compliance and enforcement activities, water allocation and infrastructure needs (Recommendation 8)**

A range of regulatory tools already exists in the North and their performance and effectiveness towards achieving water security objectives should be reviewed. This review will have a particular focus on compliance monitoring and enforcement. Frameworks already exist for drilling ground water abstraction wells and pollution control, among others. Where regulatory frameworks are ineffective Northern authorities should establish the root cause, which may lead to a focus on frameworks concerning water allocation, water efficiency, permitting and land use. As part of this review exercise, data and information should be collected and shared to inform decision making and to prioritise actions.

River basins in the North are subject to water quality issues due to discharges of municipal and industrial wastewater and agricultural run-off. These discharges affect local canals and waterways as well as large rivers, as seen in Chiang Mai. The main sources of pollution in each river basin should be identified, including pollution hotspots and areas of high impact, to enable the creation of a risk-based ranking system to prioritise action. In conducting this exercise, it may be prudent to leverage the capacity of existing river basin committees to ensure local knowledge and data are utilised to identify and tackle sources of pollution, rank the corresponding impact and recommend solutions.
Water supply and demand forecasts, prioritisation and allocations are spatially and temporally sensitive issues. It is crucial that these decisions are based on evidence using the latest available information and are transparent in their implementation. These decisions also need to make use of available meteorological data and be dynamic in application. The dynamic nature of decision making regarding water allocation was demonstrated at the Bhumibol Dam on the Ping River, which is required to make important strategic decisions regarding the volumes of water to release at certain times to serve the downstream community. Current and forecast usage of surface water and groundwater should be determined in each catchment to prioritise allocation accordingly.

When reviewing non-compliance against regulatory frameworks, the North can take the opportunity to consider the root causes and possible incentives that drive this behaviour. One approach could be to consider pioneering the deployment of economic instruments and the creation of incentive schemes to drive behaviours that align with the overall strategic objectives of increasing water security. This approach could be based on tools such as the polluter pays principle.

**Appropriate infrastructure solutions are selected with adequate capital and O&M budgets allocated**

Thailand has a history of investing in capital plant and then not allocating the appropriate operational and maintenance (O&M) budget to enable appropriate operation. This is particularly true in the wastewater sector. A number of provinces in the North have treatment plants that do not or only partially operate. This compounds water security issues through uncontrolled point of source wastewater discharges and diversion of human and financial resources.

Appropriate capital investment programmes should be aligned with financial plans. This imposes practical realities on the delivery of water security priorities, and helps ensure that decision makers consider what types of infrastructure can realistically be built and over what time period. It also drives further prioritisation and allows consideration of alternative infrastructure solutions - for example, ecosystem based solutions.

**A robust financial plan should be developed and aligned with delivery of the strategic plan (Recommendation 9)**

Due to the high fragmentation of the water sector in Thailand, it is difficult to determine the real costs of managing the sector and delivering services to consumers. Northern provinces should consider addressing this and develop a robust provincial and regional financial plan that considers the real costs of managing the water sector today and in the future. This should then be aligned with the potential revenue streams from economic instruments and funding gaps identified.

Delivery of water security objectives will require capital and operational cost investments. These costs must be included in the financial plan. This exercise will allow prioritisation of the key actions that can realistically be achieved within set time periods. A financial strategy should be developed to support delivery of the water strategy. This exercise should be conducted in consultation with key stakeholders in the North to ensure buy-in and support. Data should be available and accessible to key entities to inform prioritisation and decision making.
Conducting this exercise is an opportunity to review the current and future role of economic instruments. This review could then be used to inform development of the long-term financial plan. Existing economic instruments must be aligned with strategic policy objectives and deliver correct water security incentives, for example, behaviour change to conserve precious resources. This review process is also an opportunity to identify those economic instruments that do not support the overall strategic objectives of the sector and heighten water security vulnerability. This may include energy subsidies that increase the over-pumping of groundwater or agricultural subsidies that promote the growth of water-intensive crops.

There may be an appetite to support the financial plan and strategy through the reform of economic instruments. If this is the case, it is essential to conduct an analysis to determine the ability-to-pay and willingness-to-pay of different sectors for water and wastewater services. A long-term understanding of affordability constraints will support long-term financial planning.

Any emerging proposals regarding future changes in tariffs or charges must be well understood and communicated to the public and water users. It is essential that they have political and public support and understanding to be effective.

*Infrastructure solutions should be appropriate for the regional context, aligned with land use planning and embed innovation and long-term climate change thinking (Recommendation 10)*

Like many countries, Thailand has a tendency to over-design infrastructure solutions, as has been observed in the Ping River Basin catchment. Overly technical infrastructure solutions incur capital costs and can be difficult to operate and maintain, particularly where human and technical capacity is low. Thailand may wish to consider adherence to the OECD’s Council Recommendation on Water. The Recommendation covers policy advice on issues including water quantity and quality management, the management of water-related risks, governance, and pricing and financing water services and infrastructure. In line with the recommendations of this document, the North should ensure that when prioritising infrastructure solutions to deliver the strategy and water security priorities, solutions that are in line with local conditions in terms of construction and operation and financial affordability should be emphasised. This may include ecosystem-based solutions (OECD, 2016[8]).

When determining infrastructure solutions, local knowledge and experiences from within provinces and river basins will be key. It is important to review and set a clear role for river basin management with regard to this activity. This might include contributing to the determination of priority infrastructure specifications based on lessons learned from previous installations and elsewhere within the basin.

Water and wastewater infrastructure are typically long-life capital investments. With this in mind, any new infrastructure proposals should incorporate long-term climate resilient forecasts and embed long-term climate thinking in the design and construction and operational plans. The use of Environmental Impact Assessments or Strategic Environmental Assessments may be good tools to help embed this practice (OECD, 2019[6]).
## The Action Plan: A summary

<table>
<thead>
<tr>
<th>Expected result: Clear vision and organisation empower regional actors to deliver their water management responsibilities (ER1)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recommendation</strong></td>
</tr>
</tbody>
</table>
| The national strategy is structured to empower the development of localised and prioritised regional strategies (1) | • Draft a national strategy to set the vision and guiding principles for the water sector and the fiscal relationships between central and regional administrations.  
• Determine water management priorities at the local and regional level in line with the guiding principles of the national strategy. | NESDC NWRC  
Local and regional stakeholders  
River Basin Management Organisations of the Northern Region including Ping |
| Clarity over roles, responsibilities and reporting requirements should be ensured (2) | • Map sector roles and responsibilities against the strategy, vision and prevailing legislation. Document policy gaps, objective gaps, information gaps and capacity gaps and develop an action plan to close them.  
• Ensure better co-ordination and clear roles and responsibilities with regard to disaster preparation and recovery. This would include collection and ownership of data and information sharing.  
• Ensure clear responsibilities for strategy development, policy making and long-term planning. Ensure budget cycles are aligned to long-term plans.  
• Raise awareness of water security issues across all sectors and society. This would include water use efficiency, disaster preparation and recovery. | NWRC and its members  
NESDC regional offices  
Proposals signed off by the Office of the Prime Minister |
| Position the National Water Resources Committee (NWRC) as the multi-stakeholder platform for decision making on water issues. (3) | • Ensure that the Committee has high-level political support and ownership and a clear remit in terms of decision making and setting strategic direction.  
• Ensure that the Committee has the correct representation including from relevant ministries, river basin committees and the wastewater sector.  
• Ensure cross-sectorial issues are captured in the committee’s agenda, for example water management and economic development.  
• The Committee should meet regularly and keep complete and transparent records of meetings and action lists.  
• Regional and National Policy Dialogues are to be used to inform the NWRC through evidence-based analysis and preparation of policy recommendations and projects to establish the evidence base to support strategy and policy decisions. They would also provide a platform for consultation on issues ahead of presentation to the high-level committee. | Office of the Prime Minister  
NESDC NWRC and its Secretariat  
Northern Region Policy Dialogue (following establishment) |
| The role and responsibilities of River Basin Management Organisations must be clear and add value (4) | • Benchmark the current role and performance of River Basin Management Organisations against international practice and the vision for the sector.  
• Determine how they can support the overall management of water resources including potential roles in stakeholder management, data collection, infrastructure specification, planning and forecasting, charging and practical implementation of integrated water resources management (IWRM).  
• Provide clear guidance on the roles and mandates of these organisations.  
• Consider that some river basin committees may have stronger capacity and add more immediate value to the sector than others. Consider strengthening the remit of these key river basins to become pioneer committees and set the scene for the future development of others. | NWRC  
NESDC River Basin Organisations of the Northern Region  
Northern Region Policy Dialogue |
### Expected result: Robust, evidence-based decision making and policy frameworks prioritise regional action (ER2)

| Data must be centralised and include information on floods, droughts, water supply and demand, and water quality (5) | • Water management data is identified, collected and analysed.  
• Regional and national databases are established and are accessible to stakeholders. | NWRC and its members NESDC regional offices Regional offices of the Royal Irrigation Department, Pollution Control Authority, Risk and Disaster Prevention Regional and Provincial Statistical Office |
| --- | --- | --- |
| The level of risk and priorities should be identified at the national and regional level (6) | • Create and maintain national and regional priorities for flood protection, water allocation and pollution control.  
• Use the National Water Resources Committee, supported by high-quality analysis and data, to confirm levels of acceptable risk that are transparent to all relevant actors. This must recognise that acceptable risk could be different for different regions and for different sectors.  
• Embrace a flexible approach to risk management. Incorporate regular review processes to reflect the latest thinking and information to inform the levels of acceptable risk. | NWRC Office of the Prime Minister NESDC Provincial Administrative Organisations for each Northern Province River Basin Organisations of Northern Region Northern Region Policy Dialogue (following establishment) |
| A revised list of policy tools should be deployed to achieve national and regional objectives (7) | • An inventory of regulatory, economic and information based tools should be created. This might include tools such as flood insurance schemes, water quality standards or flood zone maps.  
• The performance of the tools should be assessed against strategic objectives of the sector with trade-offs, gaps and poor performing tools identified.  
• Update the inventory and deploy tools as required supported by investment in necessary human capital. | NWRC NESDC NESDC Regional Offices |
| Information must be used to inform decision making, prioritise compliance and enforcement activities, water allocation and infrastructure priorities(8) | • Review existing regulatory frameworks and support with compliance monitoring and enforcement. This may lead to a focus on water allocation, water efficiency, permitting and land use. Collect and share data and information around this matter to inform decision making.  
• Identify sources of pollution in each river basin and prioritise action.  
• Ensure that river basin committees have the capacity and mandate to use local knowledge and data in order to identify and tackle sources of pollution.  
• Determine current and forecast uses of surface water and groundwater in each catchment and prioritise allocation.  
• When tackling non-compliance, consider the deployment of economic instruments and the creation of incentives to drive behaviours that align with overall strategic objectives. This could be based on tools such as the polluter pays principle. | NWRC NESDC NESDC Regional Offices Northern Region Policy Dialogue (following establishment) River Basin Organisations of Northern Region Provincial Administrative Organisations for each Northern Province Governor’s Office for each Northern Province |

### Expected result: Appropriate infrastructure solutions are selected with adequate capital and O&M budgets allocated (ER3)

| A robust financial plan should be developed and aligned with delivery of the strategic plan (9) | • Develop a robust provincial and regional financial plan that considers the real costs of managing the water sector today and in the future, and align this with potential revenue from economic instruments. Identify funding gaps.  
• Develop a financial strategy and align this to the capital and operational cost requirements to deliver the water strategy, and prioritise actions. Data must be available and accessible to key entities to inform | NWRC Office of the Prime Minister NESDC Support from each Northern Region Provincial Administrative Office in terms of budget requests. |
Infrastructure solutions should be appropriate for the regional context, aligned with land use planning and embed innovation and long-term climate change thinking (10)  

<table>
<thead>
<tr>
<th>Prioritisation and decision making.</th>
<th>NWRC Provincial Administrative Organisations for each Northern Province Governor’s Office for each Northern Province</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The current and future role of economic instruments must be assessed to inform the development of the financial plan.</td>
<td></td>
</tr>
<tr>
<td>• Ensure economic instruments are aligned with strategic policy objectives and set correct incentives (e.g. behaviour change). Identify economic instruments that do not support the overall strategic objectives of the sector and increase vulnerability.</td>
<td></td>
</tr>
<tr>
<td>• Ensure any future changes in tariffs are well understood and communicated to the public and water users. They must have political and public support and understanding to be effective.</td>
<td></td>
</tr>
<tr>
<td>• Conduct an analysis to determine the ability-to-pay and willingness-to-pay of different sectors. A long-term understanding of affordability constraints will support long-term financial planning.</td>
<td></td>
</tr>
</tbody>
</table>

When prioritising infrastructure solutions for delivery of the strategy, consider solutions that are in line with local conditions in terms of construction and operation and financial affordability. This may include ecosystem-based solutions.

Review and set a clear role for river basin management. This might include contributing to the determination of priority infrastructure specifications.

Long-term climate resilient forecasts must be considered and embedded in the design and construction of infrastructure and carried through to operation. The use of Environmental Impact Assessments or Strategic Environmental Assessments may be a good tool to embed this practice.

Consider adherence to the OECD Council Recommendation on Water.

<table>
<thead>
<tr>
<th>References</th>
<th></th>
</tr>
</thead>
</table>


Chapter 4. A scorecard to track sustainable development in the North

This chapter proposes a series of indicators to assess the achievement of regional goals, as discussed in the previous chapters. The scorecard tracks the past performance of these indicators and sets targets for 2037. Where data are not available, it suggests information that national and local governments could collect to make the scorecard effective. The scorecard also maps each regional objective in the Action Plan against the Sustainable Development Goals and targets, ensuring coherence between policies adopted by the North with international standards of development.
The scorecard proposes indicators for measuring implementation and performance of the action plan until 2037

Scorecards with measurable indicators are used to monitor the implementation of policies and the achievement of desired results. The following scorecard proposes indicators to accompany the action plans presented in previous chapters. It can be used for monitoring, decision making and ensuring accountability towards citizens, and should be regularly updated and made publicly accessible.

Each indicator is designed to provide a snapshot of the status quo and to establish a target for 2037. The scorecard presents the following values for all indicators:

- The level attained by Thailand at the launch of the National Strategy 2037 and the 12th National Economic and Social Development Plan (NESDP) (2017 or latest available year).
- The level reached during the five years prior to the launch of the NESDP.
- The objectives to be attained by 2037. Box 4.1 provides details about the computation of regional objectives.

<table>
<thead>
<tr>
<th>Box 4.1. Computation of the 2037 objectives in the scorecard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional objectives for 2037 are computed with respect to the past performance of regional champions. For example, the target for productivity of the agricultural sector is computed according to the following three steps:</td>
</tr>
<tr>
<td>1. The province with the highest value added in agriculture in 2016 is identified (Nakhon Sawan)</td>
</tr>
<tr>
<td>2. The average annual growth rate of agricultural value added in Nakhon Sawan between 2012 and 2016 is computed.</td>
</tr>
<tr>
<td>3. The regional target is computed by assuming that between 2016 and 2037 the average regional agricultural value added is growing at the same rate of the best performing province as computed in the second step.</td>
</tr>
<tr>
<td>Note that this computation is possible only when data about provincial performance with respect to the indicators of the scorecard is available.</td>
</tr>
</tbody>
</table>

To help with the preparation of a multi-dimensional reporting system, the scorecard also maps each item in the Action Plan to the relevant Sustainable Development Goal.

Northern provinces develop capabilities to exploit their full potential

An effective strategy and strong LAOs drive the development of the North of Thailand

Create a strategy for developing the Northern Region, building on local discovery (Expected result 1)

The development of the North relies on the transformation of the structure of the local economy. Northern provinces need to reallocate resources to diversify their economies...
while specialising into sectors and products for which they could develop (or already have) comparative advantages. On the one hand, diversification is necessary to maximise productivity gains and minimise the risk of potentially adverse external shocks (such as trade wars or natural disasters). On the other hand, “smart” specialisation allows local economic actors to express their full potential, given the existing natural, economic and institutional endowments. The fine equilibrium between diversification and specialisation policies can lead to significant productivity gains.

The scorecard contains measures of sectoral productivity, diversification and specialisation to monitor structural reforms (Table 4.1). Higher productive gains in the agriculture and manufacturing sector (as measured by the value added per worker in each sector) would be a sign of successful structural transformation. The Herfindahl-Hirschmann index is a good measure of the average diversification of the local economy (Chapter 2). The number of sectors in which provinces could develop a comparative advantage can be an indicator of “smart specialisation”.

Table 4.1. Key indicators to track the effectiveness of the new strategy of development of the North of Thailand

<table>
<thead>
<tr>
<th>SDG</th>
<th>Objective</th>
<th>Indicator</th>
<th>Indicator</th>
<th>Indicator</th>
<th>Best regional performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>An effective strategy driving the development of the North of Thailand</td>
<td>Agriculture value added per worker (constant BHT)</td>
<td>34 512</td>
<td>34 785*</td>
<td>99 216</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Manufacturing value added per worker (constant BHT)</td>
<td>162 188</td>
<td>201 437*</td>
<td>907 981</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tourist revenue per number of visitors</td>
<td>3 147</td>
<td>9 534</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Herfindahl-Hirschmann index of economic concentration</td>
<td>0.33</td>
<td>0.27*</td>
<td>0.13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Average number of subsectors that contribute significantly to provincial value added</td>
<td>67</td>
<td>73</td>
<td>129</td>
</tr>
</tbody>
</table>

Note: The average number of subsectors that contribute significantly to provincial value added is measured using the Revealed Comparative Advantage (RCA) indicator. The RCA is based on net value added of productive manufacturing activities derived from the Industrial Census 2012 and 2017. Activities are classified according to the International Standard Industrial Classification (ISIC) at the two-digit group level.

*: 2016 is the latest year available for GPP.

Source: Authors’ calculation based on the Industrial Census 2012 and 2017 and Ministry of Tourism and Sports.

The North could improve sectoral productivity by following in the footsteps of regional best performers. For example, the productivity of the agricultural sector in the best performing province – Nakhon Sawan – grew by 4.9% each year between 2012 and 2016. If this rate is maintained, average regional productivity could triple by 2037. Similarly, manufacturing productivity in the most productive manufacturing province – Kam Phaeng Phet – has increased by 7% each year between 2012 and 2016. If the North converged to this rate, regional manufacturing could become four times more productive. The average Northern province could increase its tourism revenue per number of visitors by benchmarking policies to the experience of the regional champion in the field – Chiang Mai.

Diversification of economic activity is an important correlate of development at middle-income levels of GDP. Northern provincial economies should thus keep on diversifying. The Herfindahl-Hirschmann index measures economic concentration (higher values) and diversification (lower values). Between 2012 and 2016, this index has been decreasing because economic activity is spread more equally across sectors. If the Northern
provinces were diversifying at the same speed as the regional best performer, the index would decrease further by 0.01 points every year until 2037.

The number of manufacturing sectors with a revealed comparative advantage is increasing. The analysis of the industrial census suggests that in 2017 Northern provinces on average had revealed comparative advantages in 73 sectors, up from 67 in 2012 (Table 4.1). This figure increased from 2012. The regional best performer, Phichit, “created” the highest number of sub-sectors between 2012 and 2017 (around 3 per year). With a similar performance, the North could almost double the number of sectors contributing significantly to the provincial value added. Note that these figures refer only to the manufacturing sector, obtained through the Industrial Census. More detailed information about the value added generated by other sub-sectors (for example, in agriculture and tourism) would allow for a more complete assessment of the strengths of the Northern provinces.

Moving forward, the analysis of the production space (Chapter 2) could shed further light on the sectors or products in which provinces could specialise further. Provinces could pinpoint more precisely the products in which they have developed a comparative advantage with respect of the rest of the country by exploiting granular data from enterprise surveys, industrial censuses and regional input-output table.

Enhancing structural transformation and realising productivity gains in the North requires a new framework for social and economic development. For instance, Chapter 2 proposes a new way of conducting regional policies that differs from the traditional top-down industrial policies and relies instead on grassroots participation of local economic actors in planning, implementation and monitoring. This new framework would moreover bring the need for continuous innovation to the fore.

The Action Plan in Chapter 2 presents a bottom-up and data-driven approach designed to uncover the local potential for innovation. At the centre of this new regional policy framework are the “Smart Labs”, small and dynamic working groups gathering local authorities, entrepreneurs from rising and innovative sectors and academic experts. Depending on the number of sectors and economic activities emerging as comparatively advantageous from the data analysis, each province may have several Smart Labs. Provincial, regional and central authorities need to consolidate the development strategies produced by each Smart Lab (Chapter 2).

The purpose of the Smart Labs and the data-driven discovery process is to expand the productive capabilities of the North while achieving the Sustainable Development Goals. By opting for bottom-up specialisation process, Northern provinces could experiment a new model of growth that is inclusive of all local economic actors and respects local ambitions, potential and constraints (SDG 8). The participatory and data-driven nature of the “smart specialisation” process could help unleashing all local forces of innovation (SDG 9).

**Strengthen LAOs in the Northern Region – experiment with innovation in tax collection and transfers (Expected result 2)**

The “smart specialisation” process is effective if local authorities have enough fiscal leverage to exploit local potential and tackle obstacles to local growth. The action plan proposes three sets of policies aiming at building local fiscal capacity (Chapter 2). Two of them entails the experimentation of methods for property tax collection and of a simplified but more effective system of transfer, respectively.
CHAPTER 4. A SCORECARD TO TRACK SUSTAINABLE DEVELOPMENT IN THE NORTH

Table 4.2. Key indicators to track LAOs’ local fiscal capacity building

<table>
<thead>
<tr>
<th>SDG</th>
<th>Objective</th>
<th>Indicator</th>
<th>2012</th>
<th>2017</th>
<th>2037</th>
<th>Best regional performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strengthen LAOs in the Northern Region</td>
<td>LAOs’ direct tax revenue (% GPP)</td>
<td>0.4</td>
<td>0.5*</td>
<td>3.5</td>
<td>Uttaradit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LAOs’ direct tax revenue (% LAOs’ total revenues)</td>
<td>4.8</td>
<td>5.4</td>
<td>9.2</td>
<td>Chiang Mai</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>LAOs’ revenue from grants (% LAOs’ total revenues)</td>
<td>52.4</td>
<td>48.0</td>
<td>26.0</td>
<td>Chiang Mai</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LAOs’ revenue from general grants (% LAOs’ total revenue from grants)</td>
<td>42.2</td>
<td>91.2</td>
<td>Constant or decreasing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gini coefficient of subnational government revenues, grants</td>
<td>0.2</td>
<td>0.2</td>
<td>Constant or decreasing</td>
<td></td>
</tr>
</tbody>
</table>

Note: * 2016 is the latest year available for GPP.
Source: The values available are the authors’ calculation based on data provided by the Department of Local Administration, Ministry of Interior.

The scorecard proposes indicators to track the fiscal empowerment of LAOs. This is crucial to develop local productive capacities. Local authorities need to strengthen their fiscal position and autonomy in order to better exploit local potential and tackle obstacles to local growth. The proposed indicators measure the share of local revenues collected by provinces and the income from transfers. LAOs should be able to increase more taxes as a share of total revenue and depend less on total grants. Moreover, Thailand should prefer general grants to conditional ones and thus invert the current trend.

Northern cities drive regional development

Re-organise urban policies for performance and accountability (Expected result 3)

Cities can become drivers of regional development once they are properly defined. Urban areas in Thailand are currently defined along administrative borders and therefore underestimate the actual number of “urban users”: most of them commute every day from neighbouring administrations. The North could pioneer such a redefinition to better tailor and co-ordinate the provision of integrated urban services.

To redefine its cities, the North could apply the OECD Functional Urban Area (FUA) methodology. A preliminary analysis shows that there are four main metropolitan areas with more than 100 000 inhabitants in the North: Chiang Mai, Phitsanulok, Chiang Rai and Mae Sot (Table 2.3, Chapter 2). To refine this result and define FUAs, relevant authorities should survey the commuting time of households living in the existing urban centres – as defined by NSO – and within a distance of 300 km.

Once FUAs are defined, they should be equipped with Metropolitan Authorities and Transport Authorities (Table 4.3). Each Metropolitan Authority is a government layer, established through legislative decree and similar to the existing metropolitan area of Bangkok and Pattaya. The Metropolitan Authority co-ordinates the provision of public services and investments in infrastructure throughout the whole FUA. Those living within the Authority’s boundaries elect a mayor, who is then directly accountable for the execution of the development plan for the FUA. A Transport Authority could work independently from the Metropolitan Authority to co-ordinate the transport system of all existing administrative units encompassed by the FUA.
Table 4.3. Set up liveable and functional metropolitan areas and transport authorities

<table>
<thead>
<tr>
<th>SDG</th>
<th>Recommendation</th>
<th>Indicator</th>
<th>2013</th>
<th>2017</th>
<th>2037</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Establish a metropolitan authority for Chiang Mai, then also for other Northern cities (8)</td>
<td>Define Metropolitan Authorities by legislative decree</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

Expected result 4: Inclusive and sustainable urban infrastructure

<table>
<thead>
<tr>
<th>SDG</th>
<th>Recommendation</th>
<th>Indicator</th>
<th>2013</th>
<th>2017</th>
<th>2037</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Create a transport authority for Chiang Mai, then also for other Northern cities (10)</td>
<td>Establish Metropolitan Transport Authorities by legislative decree</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

Note: The four FUAs should encompass the following urban agglomerations which have more than 100,000 inhabitants, as identified through the analysis of the Global Human Settlement Layer: Chiang Mai, Phitsanulok, Chiang Rai and Mae Sot (Table 2.3, Chapter 2).

Inclusive and sustainable urban infrastructure (Expected result 4)

Metropolitan areas and transport authorities should periodically monitor well-being and access to services through households’ and users’ surveys (or alternatively, remote sensing and satellite data). Generally speaking, effective metropolitan areas are characterised by infrastructure allowing for faster commuting and access to basic services, such as water and sanitation. To this end, Table 4.4 proposes a series of ideal indicators that metropolitan authorities could monitor.

To ensure accurate policy targets the indicators require frequent updates. The necessary data collection could be carried out on a yearly basis through a combination of door-to-door and online surveys. In addition, satellite imagery and remote-sensing data could provide real-time information relevant for certain indicators, such as commuting patterns.

Table 4.4. Key indicators to measure the quality of services in metropolitan areas

<table>
<thead>
<tr>
<th>SDG</th>
<th>Indicator</th>
<th>2012</th>
<th>2017</th>
<th>2037</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Average commuting time within a metropolitan area (minutes)</td>
<td>49.3*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Average travel distance (km)</td>
<td>17.8*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Municipal water withdrawal (% of total water withdrawal)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Treated municipal wastewater per year (10^9 m^3/year)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: * Average commuting time and distance refers to the Chiang Mai urban area only, as identified by (Jittrapirom and Emberger, 2013[11]).

Universities and colleges become key drivers of regional development

The tertiary education system in Thailand could work to develop entrepreneurship among its students and in local communities (Table 4.5). To achieve this objective, universities and local colleges need to adapt their coursework to the needs of the local labour market
and incorporate entrepreneurship values. Identifying such courses requires a census of the current offer of tertiary institutes (Byun et al., 2018[2]). Entrepreneurship graduate classes could be both theoretical and empirical. Theoretical classes introduce students to methodologies for the identification of entrepreneurial opportunities, the development of a business model and plan, patent law, accounting and finance, entrepreneurial marketing, HR strategy and venture growth strategy. Hands-on sessions complement theoretical classes with internships and analysis of relevant business case studies.

Universities and entrepreneurs can also form partnerships to develop specific research questions for business development. Chapter 2 presented the Christian Doppler Research Association in Austria as a possible example for Northern provinces to follow.

### Table 4.5. Making universities centres of entrepreneurship

<table>
<thead>
<tr>
<th>SG</th>
<th>Recommendation</th>
<th>Indicator</th>
<th>2013</th>
<th>2017</th>
<th>2037</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Expected result 5: Universities promote entrepreneurship education</td>
<td>Integrate technical education with entrepreneurship education (12)</td>
<td>Average number of entrepreneurship courses, by university</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Expected result 6: Universities support entrepreneurship</td>
<td>Create networks of universities and private sector to support SMEs and start-ups (14)</td>
<td>Average number of university-enterprise labs, by province</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Selected indicators could then measure the impact of entrepreneurship graduate programmes and support (Table 4.6). One possible indicator is the share of youth and adults with advanced ICT skills. The Ministry of Education could, moreover, survey adults of working age to measure their skills and to establish how they are used at home, at work and in the wider community. The OECD Programme for the International Assessment of Adult Competencies (PIAAC) provides excellent guidelines in this regard. The Ministry of Education could also organise a census of courses offered by tertiary institutes and assess their “level of entrepreneurship”. Central and local authorities, as well as potential international donors, could assess the performance of university-enterprise labs by measuring the number of patents or peer-reviewed articles published by affiliated researchers.
Table 4.6. Measuring the entrepreneurship of the tertiary system

<table>
<thead>
<tr>
<th>SDG</th>
<th>Recommendation</th>
<th>Indicator</th>
<th>2013</th>
<th>2017</th>
<th>2037</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Integrate technical education with entrepreneurship education (12)</td>
<td>Youth and adults with information and communications technology (ICT) skills (% age-relevant population)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Integrate technical education with entrepreneurship education (12)</td>
<td>Students attending entrepreneurship courses (% tertiary students)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Create networks of universities and private sector to support SMEs and start-ups (14)</td>
<td>Average number of patents registered by researches and companies affiliated with the labs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Average number of peer-reviewed publications published by researchers affiliated with the lab</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Northern provinces adopt a risk management approach to water security

The scorecard proposes a series of indicators to monitor the adoption of a risk management approach to water and disaster management in the North. The first group of indicators are adapted from the OECD Water Governance Indicators. The NESDC and the OECD independently assessed the performance of Thailand with respect to the OECD Water Governance indicators. The OECD based the assessment on the material and information collected during the workshops and the meetings with local authorities in Chiang Mai and Chiang Rai, held in November 2018 (Table 4.7). It is preferable to assess current performance against these indicators and set future targets as part of a multi-stakeholder participatory process. Thailand could revisit these indicators possibly via the NWRC and collate the views from each line ministry and stakeholder involved in water management. This could be implemented via a facilitated workshop. In the long term, the North should aim to reduce the impact of floods and droughts and improve the wastewater sector to curb pollution.
<table>
<thead>
<tr>
<th>SDG</th>
<th>Recommendation</th>
<th>Indicator</th>
<th>2013</th>
<th>2018</th>
<th>2037</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Expected result 1: Regional actors are empowered to deliver water management responsibilities</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>The national strategy is structured to empower the development of localised and prioritised regional strategies (1)</td>
<td>Effective implementation of cross-sectoral policies and strategies promoting policy coherence between water and key related areas, in particular environment, health, energy, agriculture, land use and spatial planning.</td>
<td>4</td>
<td>(2)</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>Clarity over roles, responsibilities and reporting requirements should be ensured (2)</td>
<td>The role and responsibilities of River Basin Management Organisations must be clear and add value (4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Position the National Water Resources Committee (NWRC) as the multi-stakeholder platform for decision making on water management issues (3)</td>
<td>Existence and functioning of an inter-ministerial body or institutions for horizontal co-ordination across water-related policies.</td>
<td>4</td>
<td>(3)</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td><strong>Expected result 2: Robust, evidence-based decision making and policy frameworks prioritise regional action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Data must be centralised and include information on floods, droughts, water supply and demand and water quality (5)</td>
<td>Existence and functioning of public institutions, organisations and agencies in charge of producing, co-ordinating and disclosing standardised, harmonised and official water-related statistics.</td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>13</td>
<td>Data must be centralised and include information on floods, droughts, water supply and demand and water quality (5)</td>
<td>Existence and level of implementation of mechanisms to identify and review data gaps, overlaps and unnecessary overload.</td>
<td>3</td>
<td>(3)</td>
<td>5</td>
</tr>
<tr>
<td>13</td>
<td>Information must be used to inform decision making, prioritise compliance and enforcement activities, water allocation and infrastructure priorities (8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>A revised list of policy tools should be deployed to achieve national and regional objectives (7)</td>
<td>Existence and level of implementation of mechanisms to review barriers to policy coherence and/or areas where water and related practices, policies or regulations are misaligned.</td>
<td>4</td>
<td>(2)</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td><strong>Expected result 3: Appropriate infrastructure solutions are selected with adequate capital and O&amp;M budgets allocated</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>A robust financial plan should be developed and aligned with delivery of the strategic plan (9)</td>
<td>Existence and level of implementation of mechanisms to assess short, medium and long-term investment and operational needs and ensure the availability and sustainability of such finance (9)</td>
<td>n/a</td>
<td>(1)</td>
<td>4</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>Existence and level of implementation of policy frameworks and incentives fostering innovation in water management practices and processes (10)</td>
<td>3</td>
<td>(2)</td>
<td>4</td>
</tr>
</tbody>
</table>

*Note: OECD assessment in brackets. Key: 1 = Not in place; 2 = Framework under development; 3 = In place, not implemented; 4 = In place, partly implemented; and 5 = In place and fully functioning. Top figure = NESDC analysis. Figure in brackets = OECD analysis.*

*Source: (OECD, 2018[3]).*
As part of the multi-stakeholder review of performance, Thailand should also consider collecting the data and tracking indicators concerned with the implementation of water-related SDGs and the water security indicators developed by the Asian Development Bank as part of its Asian Water Development Outlook (AWDO) exercise. The AWDO indicators are a composite indicator of five water-related dimensions – household, economic, urban, environment and resilience (ADB, 2016[4]).

Northern provinces need to centralise data to improve the management of disaster risk and water resources. One of the main results of the MDCR is the lack of harmonised and centralised data on the impact of floods and water usage. In order to enhance the management of natural resources and prevent future losses from floods and droughts, the North could pioneer a new harmonised and accessible dataset of water security. Table 4.8 proposes a series of indicators that this dataset could include.

### Table 4.8. Enhance data capability to measure water security

<table>
<thead>
<tr>
<th>SDG</th>
<th>Indicator</th>
<th>2013</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring water usage</td>
<td>Produced municipal wastewater per year (10^9 m^3/year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Collected municipal wastewater per year (10^9 m^3/year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Treated municipal wastewater per year (10^9 m^3/year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total water withdrawal (10^9 m^3/year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Agricultural water withdrawal (10^9 m^3/year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Industrial water withdrawal (10^9 m^3/year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Municipal water withdrawal (10^9 m^3/year)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Agricultural water withdrawal (% of total water withdrawal)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Industrial water withdrawal (% of total water withdrawal)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Municipal water withdrawal (% of total water withdrawal)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measuring disaster impact</th>
<th>Flood duration per year</th>
<th>116*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total deaths by flood per year</td>
<td>195*</td>
</tr>
<tr>
<td></td>
<td>Total number of people affected by flood per year</td>
<td>2 000 000*</td>
</tr>
<tr>
<td></td>
<td>Damage caused by flood by type per year (USD 000)</td>
<td>8 100*</td>
</tr>
<tr>
<td></td>
<td>Number of droughts per year</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total deaths by drought per year</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total number of people affected by drought per year</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Damage caused by drought per year (USD 000)</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The latest figures measuring the impact of floods that are available only for the North date back to 2005.  
**Source:** (Singkran, 2017[5]); (FAO, 2016[6]).

Going forward: Measuring the SDGs at regional level for an integrated performance measurement framework

The SDGs are the global tool for measuring multi-dimensional development. The above proposed scorecard links each action to an SDG. However, going forward it would be desirable to collect data on SDG indicators at provincial and regional level in Thailand to allow for an integrated performance measurement framework. As an example of such a framework, Table 4.9 links the expected results of the action plan to the relevant SDG targets. Once data for these SDG targets is available at regional and provincial level this could be used for performance tracking with the same methods and principles as the scorecard presented in this chapter.
Table 4.9. The scorecard is a multi-dimensional tool to track development of the North

<table>
<thead>
<tr>
<th>Goal for the development of the North</th>
<th>SDG</th>
<th>SDG target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective framework for social and economic development of the North</td>
<td>2</td>
<td>2.4 Ensure the presence of sustainable food production systems and implement resilient agricultural practices that increase productivity and production, help maintain ecosystems, progressively improve land and soil quality, and strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters.</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high value added and labour-intensive sectors.</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>9.2 Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities.</td>
</tr>
<tr>
<td></td>
<td>9.b</td>
<td>9.9 Promote inclusive and sustainable industrialisation and increase significantly the share of employment of industry and GDP, in line with national circumstances, and double it in least developed countries.</td>
</tr>
<tr>
<td></td>
<td>17.1</td>
<td>17.1 Strengthen domestic resource mobilisation, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection.</td>
</tr>
<tr>
<td>Northern cities drive regional development</td>
<td>11.a</td>
<td>11.a Support positive economic, social and environmental links between urban, peri-urban and rural areas, by strengthening national and regional development planning.</td>
</tr>
<tr>
<td></td>
<td>11.1</td>
<td>11.1 Ensure access for all to adequate, safe and affordable housing and basic services, and upgrade slums.</td>
</tr>
<tr>
<td></td>
<td>11.3</td>
<td>11.3 Enhance inclusive and sustainable urbanisation and capacity for participatory, integrated and sustainable human settlement planning and management in all countries.</td>
</tr>
<tr>
<td>Universities and colleges become key drivers of regional development</td>
<td>4.3</td>
<td>4.3. Ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university.</td>
</tr>
<tr>
<td></td>
<td>4.4</td>
<td>4.4. Substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.</td>
</tr>
<tr>
<td></td>
<td>8.3</td>
<td>8.3. Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalisation and growth of micro, small and medium-sized enterprises, including through access to financial services.</td>
</tr>
<tr>
<td></td>
<td>9.5</td>
<td>9.5. Enhance scientific research and upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including by encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending.</td>
</tr>
<tr>
<td>Regional actors are empowered to deliver water management responsibilities</td>
<td>6.5</td>
<td>6.5. Implement integrated water resources management at all levels, including through transboundary co-operation, as appropriate.</td>
</tr>
<tr>
<td></td>
<td>6.b</td>
<td>6.b. Support and strengthen the participation of local communities in improving water and sanitation management.</td>
</tr>
<tr>
<td>Robust, evidence-based decision making and policy frameworks prioritise regional action</td>
<td>6.4</td>
<td>6.4. By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.</td>
</tr>
<tr>
<td></td>
<td>13.1</td>
<td>13.1. Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.</td>
</tr>
<tr>
<td></td>
<td>13.2</td>
<td>13.2. Integrate climate change measures into national policies, strategies and planning.</td>
</tr>
<tr>
<td></td>
<td>13.3</td>
<td>13.3. Improve education, awareness raising, and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.</td>
</tr>
<tr>
<td>Appropriate infrastructure solutions are selected with adequate capital and O&amp;M budgets allocated</td>
<td>6.1</td>
<td>6.1. By 2030, achieve universal and equitable access to safe and affordable drinking water for all.</td>
</tr>
<tr>
<td></td>
<td>6.3</td>
<td>6.3. By 2030, improve water quality by reducing pollution, eliminating dumping and minimising the release of hazardous chemicals and materials, halving the proportion of untreated wastewater, and substantially increasing recycling and safe reuse globally.</td>
</tr>
<tr>
<td></td>
<td>11.5</td>
<td>11.5. By 2030, significantly reduce the number of deaths and the number of people affected by disasters and substantially decrease the direct economic losses relative to global GDP.</td>
</tr>
</tbody>
</table>
caused by disasters with a focus on protecting the poor and people in vulnerable situations.

Source: Authors’ work.

References


ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

The OECD is a unique forum where governments work together to address the economic, social and environmental challenges of globalisation. The OECD is also at the forefront of efforts to understand and to help governments respond to new developments and concerns, such as corporate governance, the information economy and the challenges of an ageing population. The Organisation provides a setting where governments can compare policy experiences, seek answers to common problems, identify good practice and work to co-ordinate domestic and international policies.

The OECD member countries are: Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The European Union takes part in the work of the OECD.

OECD Publishing disseminates widely the results of the Organisation’s statistics gathering and research on economic, social and environmental issues, as well as the conventions, guidelines and standards agreed by its members.

OECD DEVELOPMENT CENTRE

The OECD Development Centre was established in 1962 as an independent platform for knowledge sharing and policy dialogue between OECD member countries and developing economies, allowing these countries to interact on an equal footing. Today, 27 OECD countries and 30 non-OECD countries are members of the Centre. The Centre draws attention to emerging systemic issues likely to have an impact on global development and more specific development challenges faced by today’s developing and emerging economies. It uses evidence-based analysis and strategic partnerships to help countries formulate innovative policy solutions to the global challenges of development.

For more information on the Centre and its members, please see www.oecd.org/dev.
Thailand is a fast emerging country that aspires to become a high-income economy by 2037. Strong growth has enabled the country to join the group of upper-middle-income economies in the early 2010s and to perform well in many areas. At the same time, the benefits of prosperity have not been shared evenly nationwide and the economic development has taken a toll on the environment. Moving forward, Thailand needs to master three transitions to build capabilities and sustain faster but also more inclusive economic growth: enabling further growth by unlocking the full potential of all Thailand’s regions; developing more effective methods of organisation and collaboration between actors and levels of government; managing water security and disaster risk. Based on the previous volume’s in-depth analysis and policy recommendations, this report suggests a set of actions to support these transitions. The actions focus on the North of Thailand, one of the most diverse and yet poorest regions of the country.