

# DEVELOPING MYANMAR'S LOCAL DATA ECOSYSTEM

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## PREFACE

The transition to e-government and digital means of data collection, storage, analysis and use provides the Government of Myanmar with a unique opportunity to rethink ways of working, and develop a local data ecosystem that generates quality data and strengthens the work of government.

Over the past five years, The Asia Foundation has been working with a range of government agencies across Myanmar to improve the collection and use of data, and develop and implement digital systems to support their work. The Foundation's work helps individual agencies to meet their routine responsibilities, but also enables multiple departments to work together to plan and solve local problems collectively and strategically.

The Foundation is publishing *Developing Myanmar's Local Data Ecosystem* to share its experience and learning. We hope that it provides insights of use to all stakeholders in Myanmar's governance system.

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Any faults in substance or analysis rest with the authors.

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# ABBREVIATIONS AND ACRONYMS

<b>API</b>	Application programming interface
<b>ASEAN</b>	Association of Southeast Asian Nations
<b>CSO</b>	Central Statistical Organization
<b>DAO</b>	Development Affairs Organizations
<b>DRD</b>	Department of Rural Development
<b>DRRD</b>	Department of Rural Roads Development
<b>GAD</b>	General Administration Department
<b>GIS</b>	Geographic information system
<b>ICT</b>	Information and communications technology
<b>NCDDP</b>	National Community-Driven Development Project
<b>NSDS</b>	National Strategy for Development of Statistics
<b>PDF</b>	Portable document format
<b>SARA</b>	Scanning, analysis, response, assessment

## CHAPTER 1.

# INTRODUCTION

## 1.1 WHY ARE DATA AND DATA ECOSYSTEMS IMPORTANT?

Useful, accurate data is essential for policymaking that will support Myanmar's socioeconomic development and strengthen public service provision. In making decisions, policymakers must identify, understand, and prioritize policy issues, assess and select potential solutions, and analyze the impact of interventions. At each of these stages, data can provide crucial evidence that helps make sense of complex systems and ensures value for money, responsiveness, and equity in decision-making.

In recent years, the importance of data has increasingly been recognized as part of the movement towards evidence-based policymaking. At its heart, evidence-based policymaking emphasizes that “what matters is what works,”<sup>1</sup> with the application of rigorous data analysis to understand issues and the impact of policies. The movement has been reflected in the policies of the government of Myanmar with the recognition that policymaking should be “rooted in strong evidence.”<sup>2</sup>

Today, data is ubiquitous, with technology providing new opportunities for its collection, storage, use, and analysis. Of course, data collection in Myanmar is nothing new: for centuries, administrative ledgers, geographic surveys, and censuses have provided much-needed tools for government to function. But the future is one of more data, gathered in innovative ways, such as from internet-connected sensors or public input via smartphones. Modern infrastructure and consumer devices provide the capability to automatically collect huge volumes of data, and cloud computing and big-data analytics provide new opportunities for the storage and analysis of huge datasets.

The greater availability of data is not an end in itself, however, and it will not strengthen decision-making if it overwhelms policymakers, if it is untrusted or of poor quality, if it is not available in formats that people can easily use, or if policymakers do not have the skills or tools to make good use of it.

Strengthening decision-making requires that we consider the data ecosystem as a whole (figure 1.1),

rather than focusing myopically on “lots of good data.” Fundamentally, does the right data, in the right format, get to the right people with the right skills and at the right time to support effective decision-making? Consideration needs to be given to the full lifecycle of a datapoint, including:

- **Collection.** Why, what, how, and when is data collected, and who collects it? How is the quality of data assured?
- **Storage.** What data is stored, how, and by whom?
- **Analysis and use.** What data analysis is carried out and by whom? Who uses data and how?
- **Governance.** What is the framework that governs data standards, who has access to data, and how is data secured? How do those staff working within the local data ecosystem perceive data, and what skills, training, and experience with data do they have?

If policymakers are to base decisions on data, that data must be of adequate quality to support quality decision-making. Conversely, if decisions are based on poor-quality data, there are significant risks that policy will not meet its aims. In examining the data ecosystem, special attention should be given to the quality of the data, so that there is confidence in its accuracy and, thus, its usefulness. Is the data timely, complete, accurate, consistent, and understandable (figure 1.2)? The data quality of official statistics in Myanmar has ranked at the bottom of ASEAN countries<sup>3</sup> and second lowest in a recent World Bank analysis of ASEAN statistical capacity.<sup>4</sup>

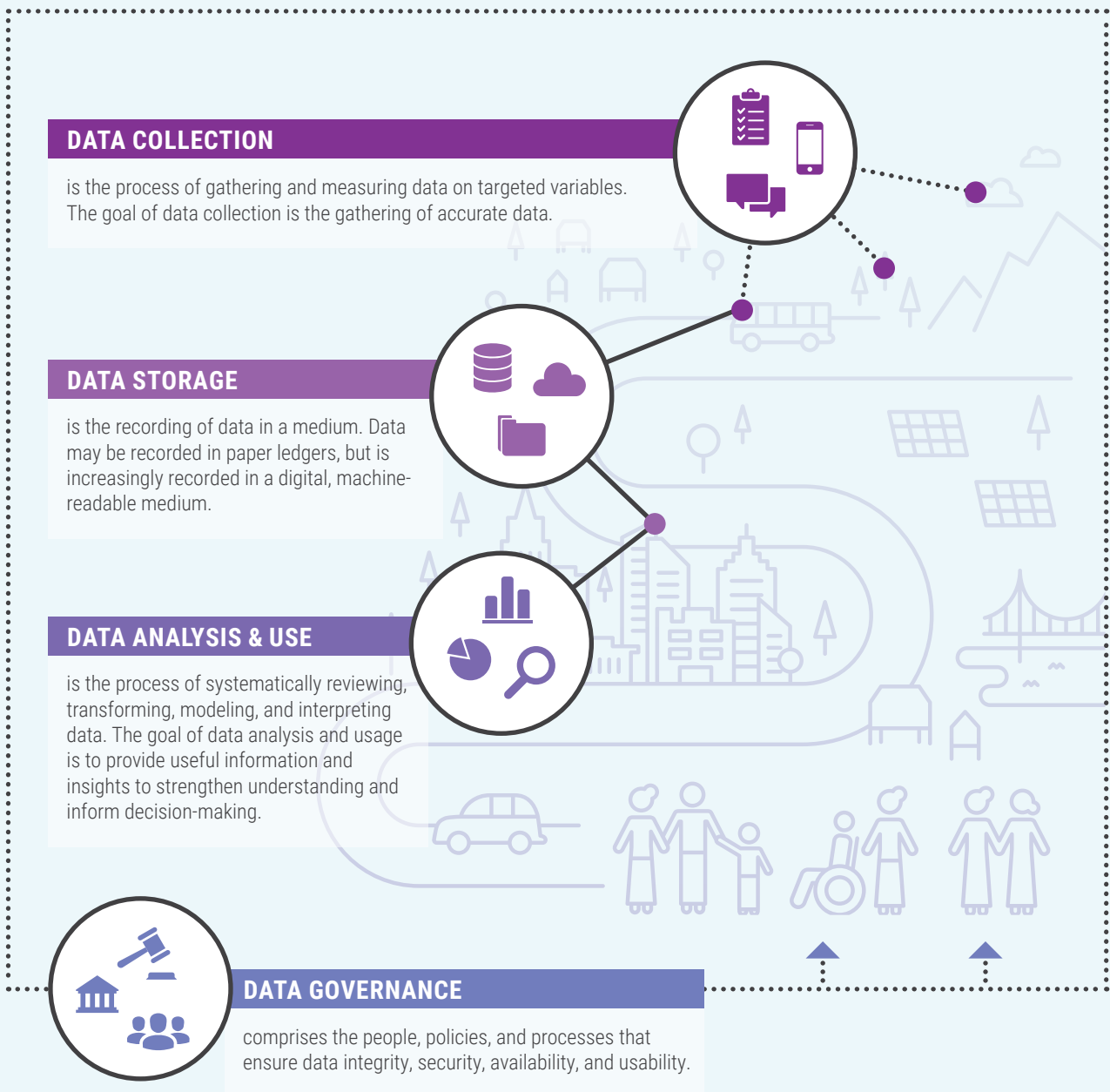
Beyond the quality of the data, it is necessary to consider the efficiency and effectiveness of the data ecosystem. For example, data collection can be expensive, and care should be taken to collect the right data, and in a way that is the least resource intensive while maintaining data quality. In many sectors in Myanmar, data collection and storage are still paper based, with some forms of data dating to the British colonial and Burma Socialist Program Party administrations. As a consequence, some data may serve little purpose in informing decision-making, and paper-based data impedes more complex computer-facilitated analysis.

## FIGURE 1.1 What is data and what is a data ecosystem?

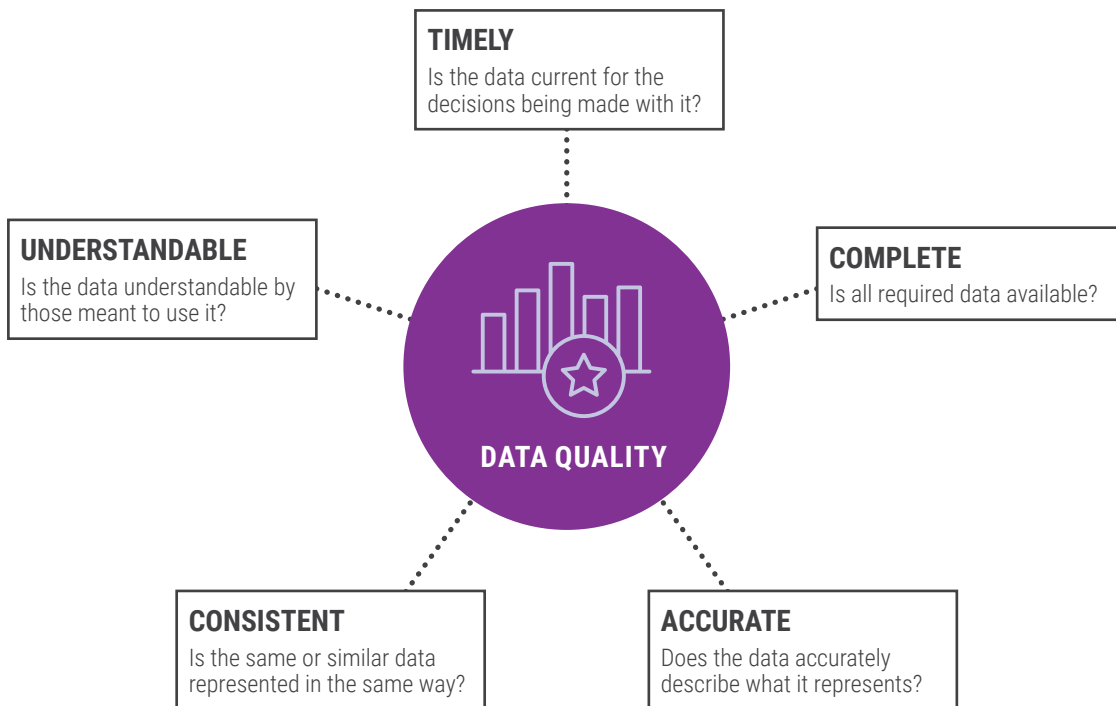
**DATA** is the collected facts and statistics that describe and record information. Data can be any factual information, such as words, numbers, measurements, observations, or descriptions, used for record-keeping, description, calculation, or analysis. Data matters because it provides the ability to comprehend, order, control, and communicate complex systems. Increasingly, data has been linked with electronic storage, retrieval, and analysis.

### DATA ECOSYSTEM

is the data system or environment in which data is collected, stored, analysed, and used, as well as the underpinning governance framework. The term “data ecosystem” refers to each of the interconnected technical components of the data system (collection, storage, analysis, use, and governance), the relationship between the components, and sometimes the human interactions with the components. This paper considers the data ecosystem to include the evolving digital data solutions and human interactions with the data system, including Myanmar’s political landscape.



**FIGURE 1.2 What is data quality?**



Evaluating the data ecosystem is particularly important at present, as advancing technology and government commitments to e-government<sup>5,6</sup> promise radical developments in Myanmar's data ecosystem in the coming years. Digital solutions hold the potential to securely, quickly, and cheaply collect vast amounts of data while making data more readily accessible to those who need it, including those outside of government, and permitting analysis that was not previously possible. Some of this potential is already being exploited by the government; for example, municipal authorities in Mandalay are proudly embracing their reputation as a "smart city,"<sup>7</sup> implementing a computerized traffic-control system, among other projects.<sup>8</sup>

The transition to digital data solutions is far from a clear path, however, and there are significant risks as well as opportunities. Myanmar is at an early stage in exploiting the possibilities of e-government,<sup>9</sup> and the reality is that most government ICT projects fail.<sup>10</sup> Digitalization can be expensive and time consuming, and ultimately may not offer value for money if reforms are unsuccessful or do not serve a clear priority.

The introduction of new digital systems and solutions, however, is a valuable opportunity not just to automate

existing processes but to rethink and revise current practices. Instead of automating a current type of data collection, perhaps the government will decide it no longer needs to collect that data.

Discussions of e-government and digital data solutions may overlook a critical aspect of the data ecosystem: the human dimension. In designing and introducing new systems, policymakers must pay close attention to the data literacy and skills of the intended users in government, so that they can make the most of reforms. Perhaps most importantly, it is critical that policymakers trust the data that is put in front of them. Regardless of how good the data is, it will have little impact if it is not trusted.

While data is critical to the future of Myanmar, and the transition to an increasingly digital data ecosystem presents tremendous opportunities, it is vitally important that policymakers making the transition be supported in ways that build and maintain trust in data and that contribute to the development of a culture of evidence-based policymaking. A starting point for supporting policymakers is ensuring that they understand Myanmar's current data ecosystem and the opportunities and challenges therein, as well as potential digital data solutions.

## 1.2 WHAT IS THIS REPORT'S APPROACH?

### BACKGROUND AND OBJECTIVES

The Asia Foundation has been providing technical support in townships across Myanmar for several years. This has included support for better policymaking in a number of areas, including tax collection, garbage collection, local planning, and urban safety.<sup>11</sup> As part of these efforts, Foundation staff have worked alongside township officials to navigate the local data ecosystem and improve data quality and utilization—from collection, to storage, to analysis. These efforts have included technological solutions to improve data quality and the efficiency and effectiveness of the data ecosystem. Through this support, the Foundation has gained some insight into the opportunities and challenges faced by township administrations, and invaluable experience in supporting sustainable reforms that effect positive change.

Based on international good practice and its own experience in township-level data use and the local data ecosystem, The Asia Foundation has produced this brief report for policymakers in Myanmar who are considering how to achieve a more efficient and effective data ecosystem with useful and trusted data at its core. With this objective in mind, the report addresses three key questions:

1. What is the current local data ecosystem in Myanmar, and how is data collected, stored, used and analyzed, and governed at the local level?
2. What are the challenges and opportunities facing the local data ecosystem?
3. How can Myanmar's local data ecosystem respond to these challenges and make the most of opportunities presented by digital data collection, storage, use and analysis, and governance?

### METHODOLOGY, SCOPE, AND LIMITATIONS

The evidence base for this report is largely drawn from The Asia Foundation's experience in 14 townships across seven states and regions, where much of the Foundation's work has been to support township officials in strengthening data collection, storage, use, and analysis. It reflects more than four years of direct implementation of multiple software platforms in partnership with several local ICT companies and more than a dozen government departments. To supplement this evidence base, we conducted a review of the

literature on data in Myanmar and good international practices in developing data systems. This brief report does not seek to be a comprehensive and systematic review of Myanmar's local data ecosystem. Rather, it is largely a reflection on the Foundation's experiences, and offers insights for policymakers and other development partners providing technical support on data.

As The Asia Foundation's support has focused on the township level, where the bulk of data in Myanmar is collected, and on supporting township officials to make better use of data in decision-making, this paper focuses on the "local" data ecosystem—that is to say, the data ecosystem at the township level and below, rather than at the state/region or Union levels.

This report looks explicitly at the distinctive local data ecosystem of the government of Myanmar, and not that of competing or alternative governance systems and institutions, which have their own systems of data collection, storage, and use and analysis.

### REPORT OUTLINE

Following this introductory chapter, chapter 2 outlines Myanmar's current local data ecosystem, with details on data management and governance, collection, storage, and use and analysis, and identifying challenges and opportunities in the existing ecosystem. Chapter 3 analyzes the potential future development of the local data ecosystem and considers in particular the potential digitalization of the ecosystem.



## CHAPTER 2.

# MYANMAR'S LOCAL DATA ECOSYSTEM

## 2.1 HOW IS THE DATA ECOSYSTEM GOVERNED AT THE LOCAL LEVEL?

### The local data ecosystem sits within the broader, complex system of local governance in Myanmar.

While the 2008 Constitution created a new level of government at the state/region level, lower administrative levels of Myanmar's governance system (districts, townships, and wards / village tracts) remained largely unreformed. The township level—the focus of this report—is at the heart of public administration. Township-level departments are responsible for the bulk of public service delivery and revenue raising, and are at close proximity to communities. Townships in Myanmar vary greatly in population, geography, area, socioeconomic development, and how affected they are by conflict. Around 40 core departments are usually present in each township. Some departments, such as the General Administration Department (GAD), are present in all townships and have a similar function in each. Other departments vary in presence or importance depending on the township. For example, the Department of Fisheries plays an important role in many Ayeyarwady townships, where fishing is vital to the local economy. Some departments have a specific geographic focus within a township, such as Development Affairs Organizations (DAOs), which have an urban focus, and the Department of Rural Development (DRD), which has a rural focus. As shown in figure 2.1, departments work together through the system of township committees, with members of parliament, community committees, and community leaders acting as important links between communities and township officials.<sup>12</sup>

**The Central Statistical Organization (CSO) is a leading agency for data governance in Myanmar.** The CSO is responsible for Myanmar's statistical policy and developing the National Statistical System,<sup>13</sup> implementing the National Strategy for Development of Statistics (NSDS),<sup>14</sup> and overseeing the Sustainable Development Goals indicators and the National Indicator Framework for the Myanmar Sustainable

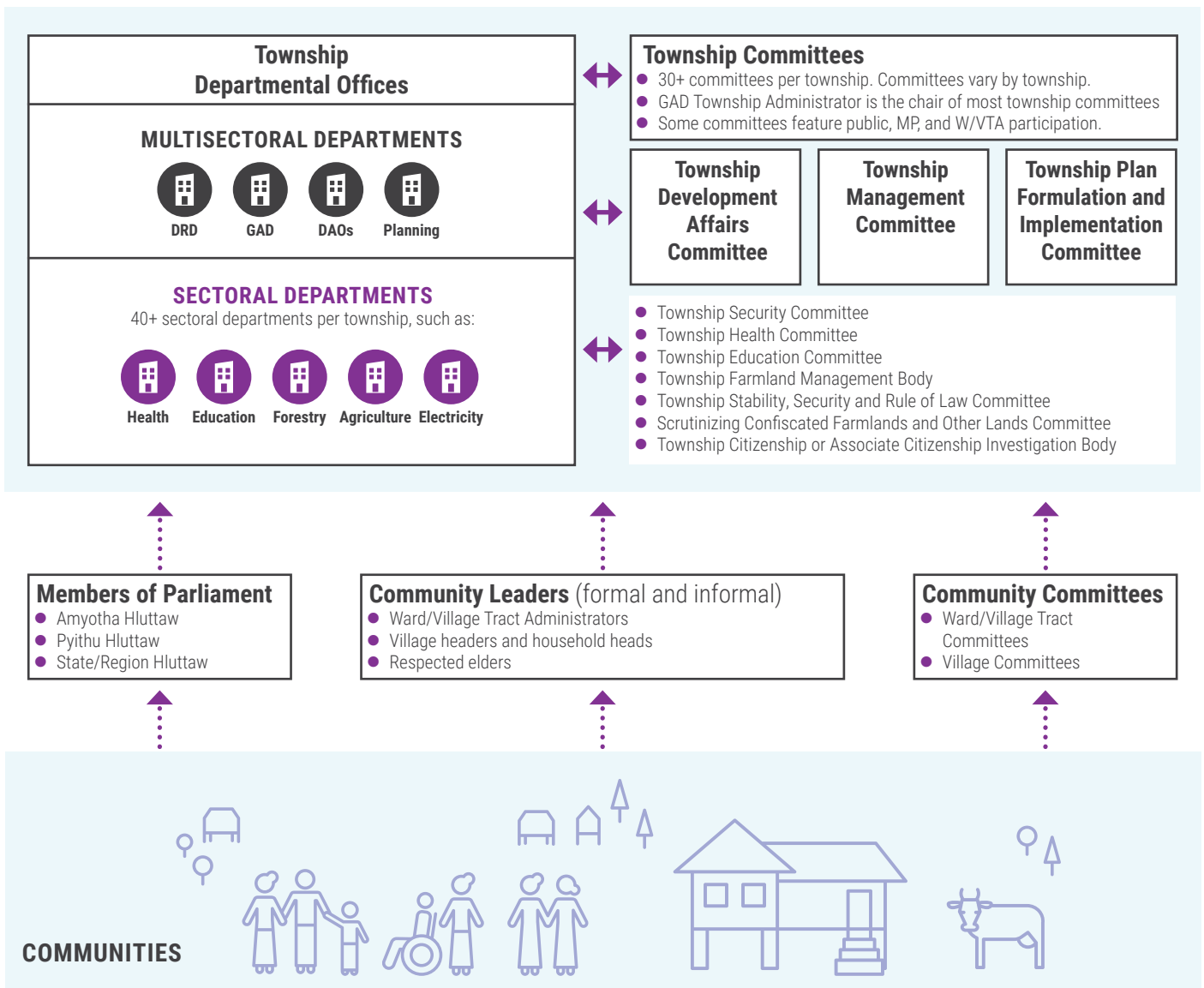
Development Plan.<sup>15</sup> The CSO is a leading member of the Central Committee Data Accuracy and Quality of Statistics Committee, which plays a coordinating role in the development of the National Statistical System. The CSO's aims and missions include:

- producing comprehensive, accurate, and high-quality statistics;
- enhancing cooperation and coordination between statistical departments and organizations;
- promoting best-practice international standards in data collection;
- using best-practice statistical techniques and software and building the capacity of other statistical organizations to use them; and
- building trust between government and the public by providing accurate, high-quality statistics.<sup>16</sup>

### The National Strategy for Development of Statistics<sup>17</sup> identifies a number of challenges in the governance framework for statistical data.

Of greatest relevance to Myanmar's local data ecosystem, the NSDS notes the fragmentation of statistical activities "managed independently by ministries and agencies according their own needs,"<sup>18</sup> and observes that there is "seldom professional compliance [with] the best practices of official statistics."<sup>19</sup> The NSDS also notes that there are no professional protocols governing the production of official statistics, no "standardized guidelines on the use of statistical concepts and definitions..., no accepted national classification systems to codify complex measures..., no established procedure for drawing samples in conducting surveys..., no explanation of metadata or quality-assurance measures."<sup>20</sup> The NSDS also points to the lack of a clear, coherent system linking local, provincial, and national data, and the lack of clarity in how subnational data are being coordinated and how accurate the current data production system is. These challenges may affect the quality and usability of data and erode trust in data that has been collected.

**FIGURE 2.1** The structure of township governance



**Different departments and their parent ministries have their own internal standards, policies, and procedures for data collection, storage, use, and analysis.** As noted by the NSDS, statistical activities are fragmented. As a consequence, there are several overlapping and potentially competing frameworks for data governance at the local level, with significant implications for the quality and usability of data. If data-collection methods vary across departments—with overlapping and conflicting definitions, for example—there is a significant risk that multiple “versions of the truth” will be developed. Even if all are equally valid, this incommensurability can prevent shared understandings of issues and make it harder for policymakers to separate valid from invalid data, undermining their trust in data overall.

**The government of Myanmar is committed to e-government, but the governance framework for digital data is incomplete.** There is currently no specific legal framework for digital data or digital security in Myanmar. In 2019, Japan provided support to develop a cybersecurity law covering e-government and cybersecurity,<sup>21</sup> but no new laws have been enacted to date. The need for a legal framework is recognized in the Myanmar e Governance Master Plan (2016–20),<sup>22</sup> which sets out the government’s planned transition to digital systems and establishes government committees to oversee implementation. The plan sets out important policies related to data security, shared IT infrastructure (including cloud computing), and open data standards. The plan calls for investment in “common data services... in order for other relevant

departments to have access.” In cases where individual departments are developing their own software solutions, “government departments need to define and follow specific policy, open-integration standards, and API standards.” While the plan’s goals align with learning from international practice, it is not clear how much progress has been made in implementation, and the plan is now in its final year.

### **Historical ways of working with data in government departments continue to shape officials’ perceptions of, and approaches to, data collection, storage, use, and analysis:**

- During the socialist period (1962–1988), central planning relied heavily on targets and quotas, and local officials felt pressured to report that targets had been met, regardless of local realities. A legacy of this system is that officials may continue to use data to produce “right” answers rather than accurate ones. Similarly, the public, as a legacy of authoritarian rule, may feel pressure to give government data collectors “safe” answers rather than the truth.
- Myanmar’s long history of centralized decision-making, which limited the authority of township officials, has meant that local officials lack decision-making experience. The promotion of evidence-based decision-making may rely incorrectly on the assumption that local officials are experienced decision-makers.
- Historically, departments and ministries have been siloed and have tended to rely on their own data, and

they may still be reluctant to share data with other departments where data-sharing practices were not previously in place.

- Likewise, government data in Myanmar has been viewed as privileged information, and there have been sensitivities around sharing data that may reflect poorly on government. As a consequence, data sharing within government, data transparency, and data publications have been uncommon.
- Traditionally, much of the work of township departments has been paper based, and new digital solutions must overcome lack of experience and significant apprehension. For any digital solution to succeed, officials must understand how it will help them do their work better. When digital solutions create added work with little perceived benefit, officials may simply revert to paper. Despite the pressure to switch to digital systems, the fact that paper remains essential—for transactions requiring signatures, for example—means it will remain the default medium for much government information.

**The skill and experience of those working with data are a critical and often-overlooked dimension of the local data governance framework.** High levels of data literacy are uncommon in Myanmar, and the NSDS notes that statistical activities are often conducted by staff with no background in statistics, under inadequate professional supervision.<sup>23</sup> Collecting high-quality data and using it effectively require training and guidance. Any work to strengthen Myanmar’s local data ecosystem must consider the skill and experience—the data literacy—of those who will do the work.

## **2.2 WHAT DATA IS COLLECTED AT THE LOCAL LEVEL, AND HOW IS IT COLLECTED?**

**The government of Myanmar has considerable experience in collecting data at the local level, and data collection is a routine responsibility of township offices.** Data collection is perceived to be a routine and fundamental part of the role of township officials. Most departments collect data on a regular basis, often annually, on a broad range of subjects and using a variety of collection methods.

**Numerous government departments are involved in the collection of data at the local level.** Many, if not all, of the roughly 40 departments present at the township level collect data. While this situation is not unique to Myanmar, the large number of government departments involved in data collection creates a complex patchwork of data, covering many sectors and areas

and creating significant challenges in understanding the local data ecosystem. Some data is collected through explicit data-collection projects; other data is information that officials collect in the course of their routine administrative duties. Consider, for example, the difference between data collected for Myanmar’s Population and Housing Census<sup>24</sup> and the household information collected by DAO officials when collecting property tax.

**Local data collection is carried out across a broad range of sectors and areas, and can be broadly grouped into the following categories:**

- **Demographic data.** Government departments collect a broad range of demographic and socioeconomic

data, including age, sex, race, religion, family status, education level, income, occupation, and race. The 2014 Myanmar Population and Housing Census<sup>25</sup> is the most up-to-date census in Myanmar, but many government departments, most notably the GAD, frequently collect detailed, community-level demographic data.<sup>26</sup>

- **Economic data.** As many as 16 Union ministries and 61 departments have economic governance functions,<sup>27</sup> and many of them collect data on the local economic and business environment. For example, the Planning Department is responsible for collecting data to calculate the annual GDP. Data is collected on the vast majority of businesses—especially micro, small, and medium enterprises—that pay their taxes, register land, and receive business inspections through local township offices.
- **Land data.** Government departments collect a variety of data relating to land use, titling, and ownership. There are at least 20 government agencies involved in land issues, with the Ministry of Agriculture, Livestock, and Irrigation taking the lead for lowland agricultural land management and the Ministry of Natural Resources and Environmental Conservation for upland (forest) land management.<sup>28</sup> Land data collected by the government can be important in resolving land disputes, and has historically been used to legitimate land ownership claims of Myanmar’s political and economic elite, although maps and records are often outdated, incomplete, or inaccurate.<sup>29</sup> Through the 2012 Farmland Law and the 2012 Vacant, Fallow, and Virgin Land Law (amended in 2018), more land users have been registering their claims, but land disputes are a persistent problem, and many households and communities have insecure claims.<sup>30</sup>
- **Sector-specific data.** All departments present at the township level collect their own sector-specific data as part of their routine administrative work, as well as to help the department and its parent ministry understand the current situation. For example, township Electricity Supply Enterprise offices maintain up-to-date information on the local electrical grid, including geographic reach, technical data on grid infrastructure, and community-level information about the number of villages with access to electricity, sources of electricity, and household access to electricity. The Department for Public Health, to select another example, collects a broad range of detailed health data, such as the prevalence and spread of various diseases. The present report does not provide a comprehensive list of all departments and data collected, but annex A gives an overview of certain leading departments and the data they collect.

- **Case data.** A number of departments routinely collect case-specific data in the course of case management. For example, departments of the Ministry of Health and Sports that provide frontline medical services record information on specific patients as part of their diagnosis and treatment. Likewise, Myanmar Police Force staff may create records related to specific crimes as part of their evidence gathering.

**The collection of a broad range of data by a large number of agencies can pose challenges for sharing data and developing a single, shared version of the truth.** The current system of data collection reflects the long history of siloing ministries and departments, which has hindered data sharing and led them to develop their own data and methods. Government officials in this system are often unaware of data that is already being collected by other departments or ministries. Different departments may duplicate data collection, and often collect different data values to measure the same thing. As a consequence, departments may assemble different or competing “versions of the truth,” which, taken together, are as likely to confuse as to enlighten. For example, different departments, having collected different demographic data, may give different accounts of how many people live in a subject area, and these accounts may be difficult to reconcile and the reality hard to discern. Even straightforward questions such as “Where is village X located?” or “Where is the township boundary?” may be unexpectedly difficult to answer (see box A).

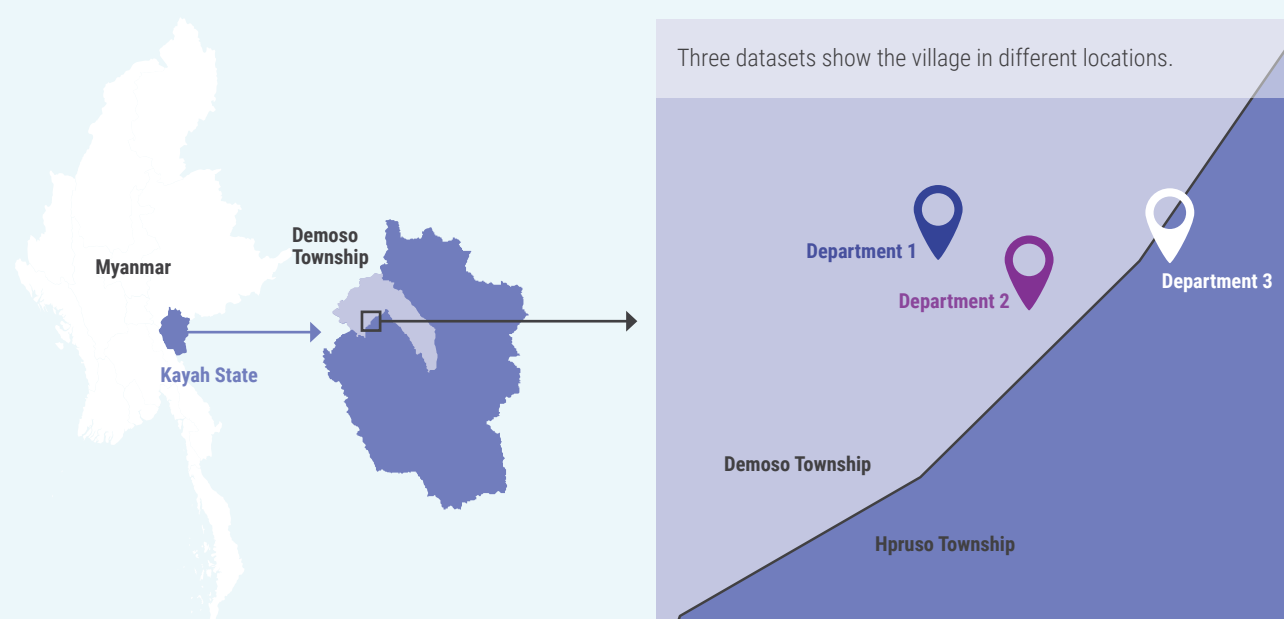
**Data collection at the local level is mostly carried out by department officials and remains predominantly paper based.** In many township departments, a specific official will have the chief responsibility for routine data collection. These officials may do most of the data collection themselves, or they may have junior officials or frontline practitioners such as school principals, doctors, midwives, etc., collect data on their behalf. For example, in the Department of Basic Education, the deputy township education officer may be responsible for a range of data—student information, test results, school infrastructure planning, etc.—the collection of which will be conducted or organized by principals of each school. Most departments still collect the majority of their data on paper. The continued need for paper-based signatures for approvals further entrenches paper systems. Paper-based data is perceived as cheaper and less easily lost.<sup>31</sup> However, paper-based collection has a higher risk of data inaccuracies (due to the absence of quality-control checks, for example<sup>32</sup>) and of loss by fire or water, and has a number of detriments for sharing, storage, use, and analysis (see the following subsections).

## BOX A

### Challenges in identifying a village's location

Departments may collect and map their own information on where villages are located. For example, figure 2.2 shows three different center points for the village of Kwaing Ngan in Kayah State, based respectively on information from the GAD, the DRD, and the DRRD. In this example, the differing locations are not miles apart, but because the village is located near the GAD's township boundary, its location may have significant implications for service delivery and elections, among other things.

**FIGURE 2.2** Identifying the location of a village



**There are examples of digital data collection that serve as potential models for replication or adaptation and adoption.** Many ministries and departments are piloting their own digital reforms to strengthen data collection. For example, over the past year, the Ministry of Health and Sports has distributed 11,186 tablets to township medical officers and basic health staff in four states and three regions. Each tablet contains hundreds of relevant health documents. The tablets (1) use Google Forms to collect demographic and health data for ministry services; (2) track inventories of medical supplies through a logistics-management system; (3) link healthcare professionals to a Google Group, which collects and shares early-warning reports for notifiable diseases; and (4) provide access to the District Health Information Software 2 system (DHIS2, box G), which includes the Mobile Birth and Death Registration Application.<sup>33</sup> In another example,

the Yangon Region government and Yangon Public Bus Company have installed Wi-Fi and GPS on their most popular bus routes. The GPS enables tracking of buses and travel times, and the Wi-Fi allows riders to answer a rider-satisfaction survey with questions such as whether the driver was driving smoothly. The Yangon Region government and its implementing partner, the Japan International Cooperation Agency, collect the data to help improve service.<sup>34</sup> In addition to more systematic reforms to support digital data collection, township department officials are making greater and greater use of their personal mobile phones as part of their daily administrative responsibilities. Phones can be used to record notes or take pictures and videos of documents, accident scenes, licensing violations, location coordinates, public disturbances, meetings, etc. Personal mobile phones may have the value of convenience, but the data collected this way



is unstructured, and storage tends to be informal and insecure.

**There are still significant barriers to digitalizing local data collection.** The resources and infrastructure needed to develop and manage digital data-collection systems are costly and difficult to assemble. The infrastructure to support digital data solutions is simply lacking in many places (see box B), as are trained and data-literate personnel to do the work.

**Data used by the government is predominantly collected by the government itself, rather than by secondary sources.** A considerable amount of information is collected by local civil society organizations, local research organizations, or members of the community, but government officials often view data from outside sources as less trustworthy, or they may be unsure how to use it. There is thus a substantial fund of data that is collected, but unused by government.

**Ward and village-tract administrators fulfill an important role in collecting community-level information on behalf of government departments.** Ward and village-tract administrators and GAD clerks collect a broad range of data for township departments. The bulk of this collection is done on behalf of the GAD, with the so-called “27 forms” gathering routine data on demography, infrastructure, nongovernmental

organizations, and law and order.<sup>35</sup> In addition to this routine information, ward and village-tract administrators get frequent, ad hoc requests for information from the GAD, sometimes on behalf of other government departments—for example, information on affected communities in emergencies such as natural disasters. This data-collection function gives them significant authority to act as the voice of communities and shape the government’s understanding of local needs and conditions. Administrators and clerks report that ad hoc data collection is increasingly conducted over the phone by department officials, rather than through the use of forms. To date, ward and village-tract administrators have received little training in data collection, posing the risk that ward and village-tract administrators will interpret and execute data-collection requests in different ways. This may affect data quality and commensurability.

**There are examples of community-led data collection, in which communities collectively provide their own data to government.** With the direction and support of the DRD, thousands of communities across Myanmar have produced village development plans,<sup>36</sup> which capture detailed information about demographics, livelihoods, infrastructure, services, and the community’s perceived development needs. Annex C provides an overview of information contained in village development plans from the National Community-Driven Development Project (NCDDP).

## **BOX B**

### **ICT infrastructure within township government offices**

Most township department offices do not yet have the ICT infrastructure to support the change to a digital data ecosystem. Technology is expensive, and significant resources will be needed to develop and manage the required infrastructure.

**Hardware.** Where township department officials do have access to computers, they are often obsolete and unreliable. Power outages are common throughout the country, and while battery backup may be available for some desktop workstations, officials often must rely on their own smartphones or tablets.

**Software.** Most government computers use Microsoft Windows 10 as their operating system, and Android is the most common operating system on smartphones and tablets. Government officials use Microsoft Word and Excel, and there is growing use of Google Docs and Google Drive. Facebook and Viber are very commonly used by township officials for communication. Antivirus software is not always used on government computers, and some software may be unlicensed, leading to significant security vulnerabilities.

**Networking.** Government offices may have local area networks to share files and printers, but they often don’t have reliable, wired internet access, and officials must resort to tethered smartphones or public Wi-Fi hotspots.

**Tech support.** When IT problems crop up, there is often no one in the township who can fix them. Sometimes the local IT shop or an acquaintance can find a solution; other times, problems just persist.

**The quality and usefulness of data collected at the local level differ widely.** Data quality may be limited by a number of factors. While some township officials express confidence in the quality of the data their departments collect, others are less confident, viewing it as “good enough” to satisfy the demands of superiors and give them a rough idea of the situation, but with no further concern for how it might be used. There are several obstacles to collecting high-quality data at the local level:

- **Lack of training.** Primary data collection is usually carried out using paper forms by staff without special training on data collection. If a form is unclear, entries may be omitted or entered as written comments instead of values. Sometimes whole sections of a collection form are dispensed with and replaced with a written narrative on the back. It is not uncommon for overburdened government staff to have family members step in to help finish the job. Reassignments within departments are common, so staff tasked with collecting data one year may do something completely different the next, requiring new staff, with limited training, to take on the responsibility.
- **Lack of quality assurance.** One significant obstacle to improving data quality—and the perception of quality—is the lack of quality assurance by local department officials. Proper data collection depends on following a careful plan. Forms should be clear in design, written in language the data collectors understand, with clear indications of the units of measurement to be used. In cases where data requests come from parent agencies, it is the parent agency’s responsibility to understand the local context and establish appropriate standards for data collection and mechanisms for quality assurance. It is unclear what form of quality assurance, if any, is routinely practiced.
- **Lack of ownership of collected data.** Local officials are often uninvolved in the design of data-collection projects that they are called upon to manage, and the data requested by parent agencies tends to serve the requesting agency’s own needs. Without a clear explanation of how the data will be used, township officials can’t understand why it is being collected, or why in this form. Instead, it’s perceived as just another task to satisfy higher-ups, or as a record-keeping exercise rather than a crucial tool for decision-making. In the worst case, township officials may suspect that the data will be used as performance metrics, and they may feel pressure to alter the results.

## 2.3 HOW IS DATA STORED AT THE LOCAL LEVEL?

**Local-level data storage in Myanmar remains predominantly paper based.** Data is often collected on paper forms, and township department offices often house significant stores of paper forms and ledgers, with manual filing mechanisms to support data retrieval. Duplicate copies may be made and shared with district, state/region, and Union offices. Paper storage has the benefit of simplicity, but paper data takes up a lot of space, can be damaged by fire or water, among other things, and is more difficult to copy than digital data.

**Where data is stored digitally, storage formats help facilitate aggregation and dissemination rather than analysis.** In some departments, officials are tasked with converting paper-based data to digital. Where this is done, paper forms are often converted into computer files in formats like PDF or Word. These formats can help officials to aggregate data (i.e., combine data from multiple forms into a single data file), and they help officials share data more easily with district, state/region, and Union offices, publish data on the internet, or

print it and share it with other parties. As detailed below, however, these file formats do not permit easy data analysis.

**Digital data storage and recording standards have not yet been established in many department offices.** While data is increasingly stored digitally in township government offices, many offices have no established standards for storing or sharing data—standards such as directory structures, folder- and file-naming conventions, and acceptable file formats. Instead, ad hoc strategies prevail, which makes data retrieval and sharing more challenging. Likewise, data-recording conventions have yet to be developed, which creates difficulties in understanding and analyzing data. For example, as shown in table A, data stored by government in Excel spreadsheets may contain blank entries (purple cells). Here it is not clear whether these entries should have been zero, they have yet to be tabulated, the data collection is incomplete, or the data has been withheld for another reason. This limits the usability of the data.

**Access to computers, digital literacy, and perceptions of data security impose limitations on digital data storage.** Not all department offices have access to computers: estimates suggest there is one computer for every 30 civil servants.<sup>37</sup> Those who do have computer access often have little or no training in file

management or the use of basic data-storage and -analysis programs such as Excel. Local officials have remarked to The Asia Foundation that paper data storage is safer and more secure—“you can’t hack paper”—while digital storage has significant risks of being lost or tampered with.

**TABLE A. Example government spreadsheet**

Village	Households	Disabled persons	Elderly persons (over 65)	Internally displaced persons
Village A	65	2	10	0
Village B	87	2	8	
Village C	113	2	14	
Village D	35		5	
Village E	47	1	9	0

## 2.4 HOW IS DATA ANALYZED AND USED AT THE LOCAL LEVEL?

**There is great variation in how much use township department offices make of the data they collect, and there is no established culture of data-based decision-making.** Most data collected at the local level is used simply for recordkeeping or to answer requests from parent agencies. While there are many examples of township department officials using data to inform their decision-making, data is not systematically and routinely used in this way.

**Many township department offices view the bulk of the data they collect as something for use by district, state/region, and Union departments and ministries.** For some officials, the data collected by their department serves purely to satisfy queries from higher-ups. While data practices at those higher levels are beyond the scope of this report, data is often aggregated to provide sectoral or national snapshots of the country’s development—through the Central Statistical Organization’s Myanmar Statistical Yearbook and Selected Monthly Economic Indicators,<sup>38</sup> for example, or the Planning Department’s GDP calculations. Analyses of these types of data may be useful for shaping laws and policies at the Union or state/region levels, but they do not lend themselves to developing township-specific policies or supporting township-level decision-making. There is, therefore, a real need for greater data use at the township level to shape local decision-making.

**A common form of data use at the township level is in summary tables of descriptive statistics for basic analysis.** For example, information such as demographic data, revenue collections, birth and death records, and departmental infrastructure investments may be aggregated into a table for review by department officials. Such tables allow for the review of basic administrative functions—for example, how have revenues varied among different areas, against targets, and in comparison with previous years—but they shed no light on the differences among communities, information that may be needed for emergency response or decisions about specific services.

**More complex data analysis and data visualization by township department offices is rare.** For example, while department officials may carry out analysis to understand tax collection, they may not calculate averages or percentages that could be used to understand data trends in a more sophisticated way. Complex descriptive or predictive analytics, such as through algorithmic or econometric models, does not occur at the local level. The absence of more sophisticated data analysis limits the ability of departments to build an evidence base for making decisions. Data is often presented in simple tables, rather than in visualizations such as charts or graphs or mapped spatially. The use of other forms of data



visualization can be helpful to spot trends and outliers. Spatial mapping, for example, can identify geographic hotspots that may need a targeted policy response.

**Basic analysis of descriptive statistics supports limited forms of evidence-based decision-making.**

For example, demographic statistics are used by many departments to plan and prioritize infrastructure investments, targeting those investments to the greatest number of beneficiaries. To prioritize road investments, the Department of Rural Roads Development (DRRD) may use information about communities' access to existing infrastructure, services, and markets; the number of potential beneficiaries; and information on the existing road network.<sup>39</sup> This analysis does not extend to a comprehensive cost-benefit or cost-effectiveness analysis, however, because officials must still decide subjectively how to quantify and weight different costs and benefits.

**Data analysis to inform decision-making is limited to routine administration rather than more complex local issues or evaluating policy interventions.**

At the township level, data is not yet commonly used to develop a detailed understanding of local issues and policy responses, in part because of Myanmar's highly centralized system of decision-making. Township officials often do not view themselves as decision-makers or policymakers and have not historically been encouraged to. Many officials view their role as "neutrally" and passively implementing instructions from above, rather than proactively setting the agenda

and developing policy responses. For example, while officials may use tax data to estimate next year's tax revenues, they are unlikely to use data to develop policy for raising revenues, such as by analyzing trends in tax avoidance or evasion, the effectiveness of tax collection practices, or the impact of previous interventions. This failure to apply data to more complex decision-making is of crucial importance, because strengthening local governance in Myanmar will depend on strengthening capacities and promoting a culture in which township department officials are expected to understand local issues in greater detail, tailor policy responses to local conditions, and evaluate the impact of interventions.

**At the township level, there is little interdepartmental data use to formulate consensus views and shared responses.**

As a legacy of previous ways of working, departments continue to carry out many of their functions in siloes, with limited data sharing or coordination to resolve local issues. At present, very little shared data analysis occurs among township departments. As township administrations and their constituent departments increasingly pursue people-centered development, however, there will be greater need for multiagency policy responses. Many emerging issues such as the development of the road network (box C), public safety, drug dependency, and homelessness require multi-agency responses.

**The ability of township department officials to analyze and use data in increasingly sophisticated ways is limited by several factors.** Granting that there are large

## BOX C

### Developing a township's road network: the need for multiagency understanding and responses

The road network in Myanmar is managed by a various departments in a number of ministries. In the Ministry of Construction, the Department of Highways is responsible for major interstate and intertownship roads, and the DRRD is responsible for the core rural roads network. In some townships, the Progress of Border Areas and National Races Department of the Ministry of Border Affairs is responsible for parts of the rural road network. In the Ministry of Agriculture, Livestock, and Irrigation, the DRD is responsible for some intra-village roads and farm access roads. In urban areas, the Development Affairs Organizations are responsible for most roads.

In addition to the obvious need for these departments to coordinate to avoid overlapping or incompatible road investments, the roads network also has significant effects on a broad range of other departments and their plans. For example, sound road investments are important for health and education departments to maximize access to services, and urban road planning needs to be coordinated with telecommunications and lighting infrastructure.

So, in order to understand the potential benefits of a given road investment, compare competing road investments, and determine the right sequence of investments for the greatest impact, many departments need to work together to share information, jointly determine priorities, and develop a coordinated, strategic plan that ensures the best value for money.

differences in capabilities between townships, there are certain common challenges that prevent township department officials from routinely and systematically making evidence-based policy:

- **Absence of a culture or history of data analysis at the local level.** Most township officials have had little exposure to data or how data can be used. Without this exposure, and a clear sense of how data can help with their jobs, they are unlikely to increase their use of data. Local officials are familiar with their role as data producers, but they have little awareness of what it means to also be data consumers. Officials tasked with collecting data are expected to pass that data on to higher administrative levels. They are effectively precluded from conducting any analysis or thinking critically about the data they collect. Thus, there is little demand for more data or more analysis.
- **Collected data insufficient for effective analysis.** Data that is collected tends to be aggregated statistical data, which may not capture the nuances of a given situation. For example, to understand traffic accidents, the times, places, and individuals affected are critical considerations, not just the raw numbers of accidents or fatalities. Spatial data in particular can be of great use to decision-makers, but the practice of including spatial codes with geocoordinates alongside other data is rare.
- **Ill-suited formats.** Data stored as paper, as Microsoft Word documents, as unstructured spreadsheet files, or as PDFs is difficult to analyze. Aside from what can be done by hand, even simple analysis requires that the data first be formatted. Creating structured data from unstructured data is time consuming and often is simply not considered.
- **Poor digital infrastructure.** Effective analysis depends on having not only properly structured data but also adequate hardware, software, and, of course, electricity. Although townships vary considerably in this regard, inadequate infrastructure in all these categories is common (box B).
- **Data-analysis skills.** Township staff who pursue data analysis have few resources to develop their skills. Familiar with producing totals, averages, counts, and perhaps basic charts and graphs, many staff would like to develop their competencies further. When data trainings are offered, staff are enthusiastic participants, even at weekend classes. There is a need to build basic numeracy and critical thinking along with data-management and analysis skills. Officials must be able to ask themselves what they expect to find in the data, to determine whether the data matches those expectations, and to assess the overall quality of the data. In the case of spatial data, for example, only a few departments have staff with

the skills for effective analysis. As already noted, hardware and software to support more advanced skills are often lacking.

**There are examples of township department offices carrying out more complex data analysis and use.** For example, the Taunggyi DAO has turned to technology and data to help it expand its water supply network, improve sustainability, and enable residents to analyze their own water use. A team of engineers used google maps to spatially locate critical elements of its water supply system and to devise a sequential plan to extend the network to new households. It has introduced water meters to encourage households to ration water use and to obtain information on how water demand varies across different parts of the city. It has begun piloting smart water meters that will provide real-time data on household use and help identify where leaks have occurred. The smart water meters can be synced with households' phones through the MyoTaw mobile application, enabling households to assess their own water use through their phones. Planned features include the ability to set usage caps and receive automatic push-notifications as their usage nears these limits. In another example, the Mandalay City Development Committee has installed remote-control traffic lights, high-definition video cameras, road sensors, and loudspeakers at intersections throughout the city. Software in the traffic control room collects data and generates dynamic traffic-flow visualizations for a handful of trained officials overseeing the system. The new technology, the Sydney Coordinated Adaptive Traffic System (SCATS), uses artificial intelligence to optimize traffic flows across the city. Learning and improving over time, it can answer questions such as, "To maximize traffic flows, how long should the green light stay on during rush hour?" The system runs daily experiments and makes continual, small adjustments without the need for a human operator. SCATS has already increased traffic flows over one of Mandalay's main bridges by a reported 50 percent.

## CHAPTER 3.

# TOWARDS A DIGITAL LOCAL DATA ECOSYSTEM

There are compelling reasons for the government of Myanmar to move towards a digital local data ecosystem. Switching to digital systems reduces the burden on government officials, helps streamline processes, and facilitates easier and less costly interactions with businesses and the public. Digital collection methods can capture better data, and moving information from paper to digital formats permits more

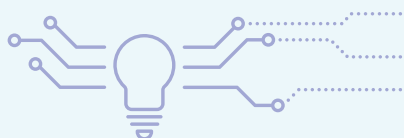
effective data sharing and analysis and access to real-time data.

Reflecting on experience in supporting township-level evidence-based policymaking and digital data solutions, this chapter lays out the guiding principles and key considerations for developing Myanmar's digital local data ecosystem.

## 3.1 GUIDING PRINCIPLES FOR DEVELOPING A DIGITAL LOCAL DATA ECOSYSTEM

### Six guiding principles for developing a digital data ecosystem

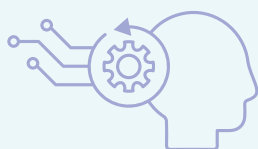
1. Digital solutions are not an end in themselves



4. Data integrity and trust in data should always be the priority



2. Digital reforms are important because they are an opportunity to reimagine existing ways of working



5. Digital reforms should start small.



3. How data will be used should be the starting point for digital reforms



6. The sustainability of reforms should be considered from the beginning.



**While digital solutions have many potential benefits, they are not an end in themselves and may not necessarily improve the work of government.** Adopting new technology and introducing new digital tools and ways of working are expensive and time consuming, and experience from around the world includes costly, failed projects that have delivered few benefits.<sup>40</sup> Before proceeding, government must consider carefully whether a proposed project reflects government priorities, is realistic, and offers value for money.<sup>41</sup> Technology is ultimately a tool. The tool's purpose and use is as important to success as the tool itself.

**The transition to a digital data ecosystem is important, in part, because it offers government an opportunity to reimagine existing ways of working.** Doing the same things as before, but now digitally, is not the hallmark of most successful government digital projects. Instead, governments carry out in-depth systems analysis to reconsider their priorities, reevaluate workflows to better meet those priorities, and reimagine their work, choosing to digitalize as appropriate and deploying the right technical tools (see box D). Systems analysis also provides an opportunity to reconsider staffing numbers and essential capabilities.

**The starting point for the development of a digital data ecosystem is a focus on how data will be used.** Government should work backwards from the priority policy problems they are seeking to solve, asking what specific data would be most helpful to understand these problems. Every piece of collected data should have a purpose, and departments and ministries with overlapping data interests should work together, wherever possible, to ensure that collected data serves their several purposes. By considering the needs of data consumers across government and at each administrative level, higher quality and more useful data will be collected. In the past, the purposes of the Union government defined what data should be collected. As Myanmar continues the twin processes of decentralization and people-centered development, the data needs of township officials should be given greater weight. Data collection can be expensive, so government should be circumspect when considering what data, and how much, to collect.

**In reforming the data ecosystem, data quality and trust in data should always be the priority.** System reforms must always focus on data quality. Data must be timely, complete, accurate, consistent, and understandable (figure 1.2). If data quality is poor, evidence-based policymaking will be an illusion, and decision-making will not improve. For data to be used effectively, all those working within the data ecosystem must trust the data they work with and understand the data's strengths and weaknesses. This requires a culture in which individuals can speak honestly about the strengths and weaknesses of the data they are presented with, and users can

triangulate across different data sources before making decisions.

**Reforms to the data ecosystem should start small and develop iteratively.** Bigger digital reform projects carry greater risks of failure, and big, ambitious initiatives that promise to solve multiple complex problems are less likely to achieve complete success. Instead, government should start small, with modular, integrated solutions, developed iteratively with the participation of stakeholders, that solve parts of the puzzle in a strategic and coordinated way. End-to-end piloting of all system components, both human and technical, before rollout is essential to identify unforeseen challenges and make adjustments before scaling. The early use of prototypes can help stakeholders iteratively develop a technological solution that best meets their needs.

**The sustainability of reform efforts should be considered from the beginning.** Does the government have sufficient funds for the system's intended scale and anticipated lifetime? Do government officials across the data ecosystem have sufficient motivation, skills, and knowledge to run the new systems without intensive support? Where possible, existing, proven technologies should be used, and the complete life-cycle costs of reforms should be identified. Systems should be designed and implemented so that participants can build needed capacity and benefit from the reforms.

**“ SYSTEM REFORMS MUST ALWAYS FOCUS ON DATA QUALITY. DATA MUST BE TIMELY, COMPLETE, ACCURATE, CONSISTENT, AND UNDERSTANDABLE. ”**

## BOX D

### Reimagining township administration

The transition to a digital data ecosystem gives government an invaluable opportunity to reimagine township administration and develop new priorities and ways of working. This reimagining will shape the data that is collected, how it is shared and stored, how it is analyzed and used, and the digital solutions to support these new ways of working.

The work of township administrations can be divided into two “levels” (figure 3.1). The first level comprises the work of individual departments performing their own core functions—for example, the DAO collecting property-tax revenue. Much work at this level can be carried out in isolation from other departments. The second level comprises cross-departmental work that involves multiple departments working together to solve problems and coordinate planning and policymaking—for example, departments working together to develop the roads network (see box C).

At both levels of administration, technological solutions can improve the effectiveness of the data ecosystem and the work of government. Most solutions to date have been developed by individual ministries, and they have tended to focus on the core functions of individual departments. But many local problems—and, indeed, the development of a strategic, integrated plan for the township—require a coordinated, cross-departmental approach. This requires policymakers to think explicitly about how to increase the ability of departments to work together, the extent to which the current data ecosystem supports cross-departmental work at the township level, and the development of technology for coordinated, shared data collection, storage, use, and analysis.

**FIGURE 3.1** Reimagining township administration

#### LEVEL 1

##### Meeting individual responsibilities:

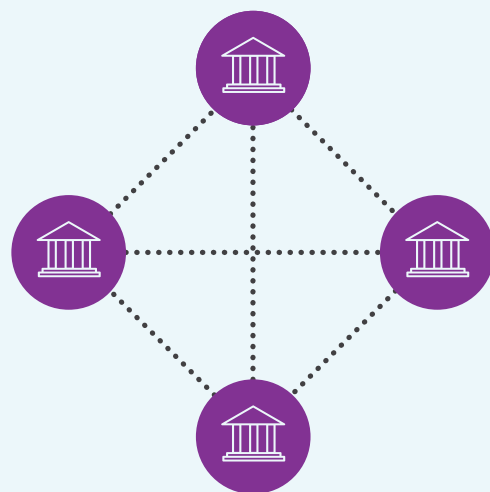
Single departments perform their own core functions.



#### LEVEL 2

##### Cross-departmental coordination:

Multiple departments work together to solve problems and plans.





## 3.2 CONSIDERATIONS FOR DIGITAL DATA GOVERNANCE

### **Myanmar needs a clear digital data governance policy that is shared and understood by all ministries and departments across all administrative levels.**

Core policy elements such as data sharing, data security, and privacy policies should be clearly defined and broadly shared and accepted. It is important that these policies be effectively communicated to, and understood by, those at the township level as well as their Union-level counterparts. Digital data solutions developed in the absence of a clear policy framework can easily be rendered obsolete by future policies, wasting previous investments or generating costly, additional work to make solutions compliant.

### **Suitable quality standards for digital data should be developed, and metrics and terminology should be standardized.**

Data-quality must be assessed and ensured by the application of clearly understood standards. Data-quality assessments should become routine, and methodological support should be provided for township-level data collection and data review. The standardization of metrics and terminology across departments and ministries, with clear, publicly available definitions, will maximize the utility of data sharing and reduce the likelihood of redundant or conflicting data collection. In Myanmar, it is likely that the CSO, which already plays a leading role in data governance, will be responsible for data standardization. Many countries have agencies responsible for ensuring the integrity of statistics that could serve as models for Myanmar (see box E).<sup>42</sup>

### **Clear policies and procedures should be developed to support interdepartmental digital data sharing.**

As noted in chapter 2, the ability of township administrations (and state/region and Union governments, at higher levels) to respond to complex social problems faced by communities and their members will depend on the ability of administrators to work across departments, share information, develop shared understandings of issues, and coordinate responses. To do this, clearer-data sharing policies and procedures will need to be developed. More effective data sharing will also reduce duplication of effort, lightening the burden of data collection on individual departments.

**Appropriate data-access protocols and data-security systems should be developed to ensure the security of government data and to protect people's privacy.** The ease of access offered by technology needs to be carefully managed to ensure that government data is stored securely and cannot be lost or stolen, and to ensure that the privacy of

personal data is maintained. International standards<sup>43</sup> exist that set out clear guidelines that can be used by governments to establish, implement, maintain, and improve information-security management systems and manage information security risks. The standards focus on ensuring the preservation of confidentiality (information is accessible only to those with authorized access), integrity (safeguarding the accuracy and completeness of data), and availability (ensuring that authorized users have access to information). These standards promote the systematic examination of information security, instead of piecemeal approaches that may vary among ministries, departments, or projects. As the government collects more personal data digitally, ensuring its confidentiality and security will become increasingly important.

### **BOX E** **The UK's Office for National Statistics**

The UK's Office for National Statistics (ONS) is responsible for collecting, analyzing, and disseminating statistics about the UK's economy, society, and population. The ONS releases over 600 statistical publications a year.

In addition to its role in the collection and publication of national statistics, the ONS offers a Methodology Advisory Service that provides advice, guidance, and support to the public sector on statistical and survey methodology, including:

- methodological advice on production and analysis of data
- development of surveys or outputs
- quality assurance of methods or outputs
- cross-cutting reviews of processes and methods across a department's statistical work
- evaluation of competing sources

The Methodology Advisory Service could be a useful model for how Myanmar can support the work of departments and ministries in strengthening their own efforts at data collection, storage, analysis, and use.

## 3.3 CONSIDERATIONS FOR DIGITAL DATA COLLECTION

**The starting point for data collection is how the data will be used.** As township administrations play a greater role in people-centered development, township departments may need to collect new data to understand people's experiences and the challenges they face. As outlined in chapter 2, current data-collection projects occur largely at the behest of administrators at the national or state/region level. However, many of Myanmar's most pressing development problems are local. Complex local problems require township departments to work collaboratively, using systematic problem-solving approaches such as the SARA model (box F). Once township administrations have collectively identified and prioritized problems, they can consider the available data and where there may be gaps. Data collection can then be locally tailored to bridge these gaps.

**Higher-level administrators should review existing data-collection requests with the aim of reducing the burden on township officials.** The transition to digital data collection is an opportunity for all ministries and departments at every level to reexamine data collection. Digital data collection can be more efficient, but if data has no clear use, it is most efficient to stop collecting it. In reviewing their data-collection requests, higher authorities should consult with township administrations to ensure that, wherever possible, the data can also be of use to township officials and that digital data collection is not overly onerous (box G).<sup>44,45,46</sup>

**Data collection at the township level should be reimagined to include "missing voices," so that the data collected is inclusive and reflects the diversity of experiences and needs within communities.** While governments and officials typically think in terms of what data is available, it is important, when addressing social problems, to consider what data they do not have. "How we collect and understand data, and design solutions to social challenges, is generally framed from the standpoint of the dominant racial, social, and cultural majority."<sup>47</sup> If township administrations are to solve the local problems that matter most to communities and their members, these communities must be heard, especially in the kinds of data that are collected. To be inclusive, data collection must be representative of the different groups within a community, because different groups experience problems in different ways, or have different, sometimes competing priorities. For example, on questions of public safety, men often identify theft as the top priority, whereas women often highlight the dangers of walking home at night—something that decision-makers, typically men, may not have considered. Similar considerations bear on how, when,

### BOX F The SARA Problem-Solving Model

The SARA problem-solving model has been used successfully by police forces and local authorities around the world. This systematic, evidence-based process has four stages:

1. **Scanning.** Identify and prioritize problems.
2. **Analysis.** Collect and analyze data to identify the underlying causes of the problem and to narrow the scope of the problem as much as possible.
3. **Response.** Tailor activities to address the causes of the problem.
4. **Assessment.** Measure whether the response had the desired effect. Make changes to the response if necessary.

This approach works best when government departments and service providers work together to collect, share, and analyze data about problems in their area, and when there is constructive engagement with the public throughout the process.

and by whom data is collected. Collecting data at times or in places frequented by just a subset of the community can introduce bias. If the data collector or the data-collection tool appears to be a threat or a security risk, respondents may not answer truthfully. For example, a combination of social norms, mistrust of the justice system, and a lack of comprehensive legislation have caused severe underreporting of data on gender-based violence. Likewise, in conflict-affected areas of Myanmar, government data collection may be met with mistrust if communities do not know how data will be used. Government data collection can also be expanded to include secondary sources like civil society organizations and community groups that have been documenting local issues. Such groups can assist in and even codesign data-collection efforts to make them more inclusive.

**Digital technology can make local government data collection more effective and efficient.** Mobile phone, tablets, and computers can all make data collection

## BOX G

### District Health Information Software 2

District Health Information Software 2 (DHIS2) is open source software for the entry, analysis, and presentation of health data. The Myanmar National Health Plan (2017–2021) underscores the use of DHIS2 as a common national platform to integrate existing, parallel health-information systems whose “fragmentation” has “overloaded” grassroots healthcare workers with reporting burdens. Although the use of DHIS2 is widespread in government hospitals and public health offices, certain functions and uses are still in pilot mode as the national rollout of the platform continues.

DHIS2 is used in selected government hospitals to record births, deaths, and the number of current in-patients, among other statistics. The process begins as a daily, paper-based census of hospital wards, which is then used to create a master list in the Archives Department, ultimately to be entered into DHIS2. In one general hospital, for example, two workers—so-called “DHIS2 focals,” chosen for their computer skills—transcribe paper ledgers into DHIS2. They are several weeks behind: one individual describes his work catching up on this data lag as “repaying a debt.”

At another hospital, one DHIS2 focal recalled the frustration of a five-day interruption in internet service, but added that her hospital has benefited from DHIS2, in that many of her colleagues now make routine use of spreadsheet software. She has designed her own Excel template to record emergency admissions to the hospital. She hopes to use this admissions dataset to map where hospital patients are coming from. She says, “I want to start with one month’s data and show the results to the head of the hospital. If he agrees, I want to map a whole year’s worth of admissions.”

DHIS2 is primarily used for data entry and reporting, and a 2016 review found that the software’s more advanced data-analysis and visualization functions were rarely used. Observations in three townships in late 2019 found that DHIS2 was still used primarily as a data-entry tool. Clear deadlines, consistency standards, and lines of reporting all the way to the Union ministry ensured timely data from township offices, but evidence-based planning and management at the township level were still limited.

more efficient. For officials collecting data in the field, mobile phones are powerful devices that can improve data-collection practices. Mobile phones are increasingly being used by township officials to make notes, take pictures, and record sound and video. This data needs to be categorized, structured, and secured to ensure effective retrieval and data security. There are free apps that can create customized data-collection forms, helping to ensure good data and synchronize data to the cloud, and perform analysis. They are relatively intuitive and can be used without extensive training. Custom app development is complicated, but Myanmar has a growing number of homegrown app developers. Government must evaluate whether to provide officials with government hardware. Phones and tablets are expensive, have limited lifespans, and rely on local tech support. Even when the government provides them, officials can be reluctant to use tablets or phones outside the office for fear of breaking them and having to pay. For example, officials provided with tablets have been observed using pen and paper in the field, then recording the information to tablets back in the office. Digital data collection can be more difficult

in remote areas that lack mobile service, reliable electricity, and tech support.

**Government must weigh the competing merits of digitization and digitalization.** Digitization and digitalization are often conflated. Digitization is the process of converting information into a digital format; digitalization is the transformation of existing processes with digital technologies. Digitizing data can have lower hardware costs, but it may also be more labor intensive, as it requires people to manually enter data from paper records. Digitization can also affect data quality by introducing data-entry errors. Digitalizing data collection can reduce the amount of time spent rewriting the same information, typically a requirement of paper systems, and it allows data to be collected and shared in real time. For instance, within seconds of data being entered into a digital form on a tablet, information (and analysis) can be made available to decision-makers. In 2018, DAOs in Magway began parallel processes of digitization and digitalization, creating an interesting case study in the relative merits of the two approaches (box H).



## BOX H Digitization and Digitalization in Magway DAOs

In 2018, Development Affairs Organizations in Magway began a move to digital collection processes to streamline tax collection and provide data for decision-makers.

The seven most-populated townships opted for a digitalization model and introduced tablets for tax collectors. Information entered at the start of the process, such as household addresses and demographic characteristics, was preserved for subsequent tax collection periods. Tax collectors no longer had to reenter this information every six months. As tax collectors went about their collections, the information was instantly available to more senior officials, who could track collection progress in real time.

Digitization was chosen by the remaining nineteen townships. Paper records were collected and then manually entered into the Myankhon revenue-management system. The data from all 26 townships was then available to senior officials for analysis and decision-making. But to keep the data in the system up to date, it must be manually entered for each collection period.

**Technology provides new methods and tools to collect data directly from local populations.** Almost every adult in Myanmar now has access to a mobile phone, and the social media applications Facebook and Viber connect the majority of adults. This provides an immediate opportunity for township officials to interact directly with the people they represent—sharing information, announcing policies, soliciting public opinion, and giving people an easy way to do things like paying taxes (see box I).<sup>48</sup> An official Facebook page, for example, might introduce local officials to the public and solicit suggestions from voices they otherwise would not hear. But officials should think carefully about whether comments on social media are really representative of the public at large. A deluge of social-media data could also be a curse. Communities can easily capture data in the form of a message or a picture and send it to officials, but masses of unstructured data from local populations could overwhelm officials and create unrealistic expectations of their ability to respond. And social media has its own peculiar forms of abuse, including misinformation (“fake news”), anonymous hate speech, bullying, and threats.

## BOX I Crowdsourcing Community Feedback

Crowdsourcing is the practice of engaging a “crowd,” or group, for a common goal, powered by digital technologies. In Myanmar, crowdsourcing is being used to help municipalities better understand and respond to resident’s needs.

The process began with residents leaving posts on the Facebook pages of municipal staff, informing them of the improvements they’d like to see in their city. Many DAOs now have their own, dedicated government Facebook pages, which have grown so much in popularity that officials now feel overwhelmed by suggestions. With so many suggestions, and limited budgets, officials have struggled to prioritize reported issues and respond to all the messages received.

To address this, Yangon, Taunggyi, and Mawlamyine have turned to mobile applications that allow issues to be reported without the expectation of a conversation with an official. The Digital Yangon app, for example, allows residents to report abandoned vehicles, water leaks, or waste disposal problems in six downtown areas of Yangon.

The MyoTaw platform has taken this a step further and introduced a Facebook chat bot, embedded in the Taunggyi DAO Facebook page. Instead of having to download an app, which is not yet a common practice in Myanmar, residents can use their preinstalled Facebook Messenger to swiftly report issues. The information gets uploaded in real time to a map-based case-management system enabling the municipality to better prioritize their responses.

**“ TECHNOLOGY PROVIDES NEW METHODS AND TOOLS TO COLLECT DATA DIRECTLY FROM LOCAL POPULATIONS. ”**

### 3.4 CONSIDERATIONS FOR DIGITAL DATA STORAGE

**Digital data storage can store large amounts of information securely and cheaply in a way that facilitates quick retrieval and data sharing, but current data-storage practices are not systematic.** Local digital data storage offers massive capacity, good security, fast retrieval, cheap, easy backup and copying, and convenient sharing. Township department offices usually have shared hard drives and sometimes a network drive, and USB thumb drives and external hard drives are cheap and ubiquitous. Cloud-based storage offers most of the benefits of local storage, with added levels of password-protected security, data synchronization with local devices, and backup and recovery of deleted files. Township officials with internet-connected devices have been making increasing use of cloud storage. Google Drive is a popular service. With well thought out rules for filenames and directory structures, retrieval and sharing can be fast, reliable, and convenient, but many users simply use the default directories and naming conventions that come with their apps and devices, depositing files with cryptic filenames in unknown locations and thwarting data management and retrieval.

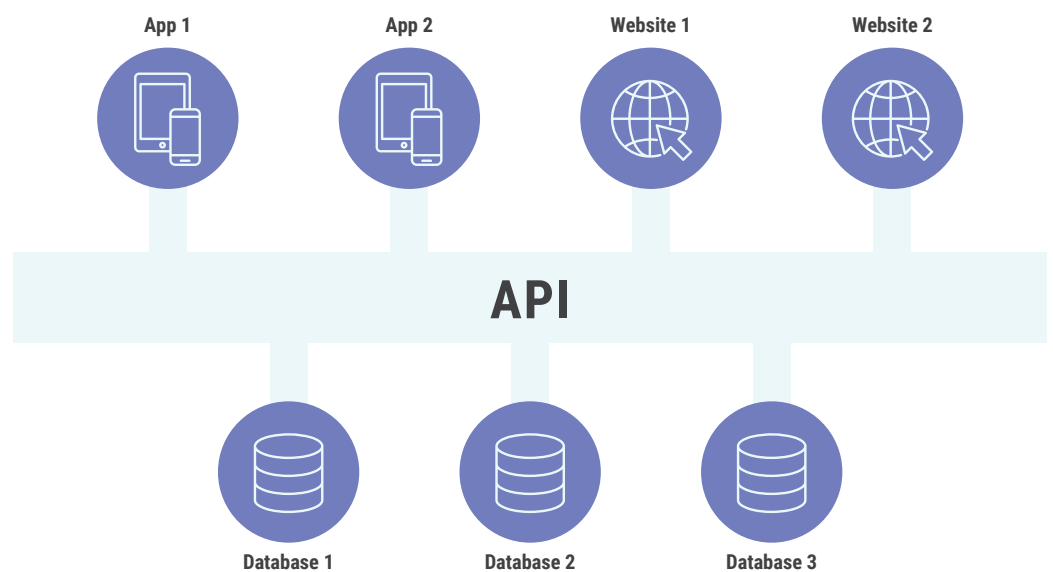
**Digital solutions can facilitate effective data sharing.** Digital data storage creates new possibilities for large-

scale data sharing within and without the government. For example, the widespread adoption of technically simple interfaces accessible by a wide range of devices, known as an application programming interface (API, figure 3.2), makes it easier for devices and software of all kinds to connect with widely disparate data sources. An API removes the need for human involvement in the data-sharing process, allowing quicker and easier access and eliminating human error. The ease of access offered by APIs needs to be carefully managed (see above).

**Data loss is the greatest digital storage issue that data managers face.** Disorganized data is more likely to be inadvertently deleted and overwritten; township officials may not always ensure data is effectively backed up; and small, portable storage devices such as USB thumb drives are easily lost. Apart from loss, the ease of copying and sharing digital files creates the risk that data will fall into the wrong hands, through theft or careless sharing. As the quantity and value of stored data grows, the risks of inadequate data-security protocols grow too. Worldwide ransomware attacks on municipal government computer systems are only the most recent and obvious example.

**FIGURE 3.2 What is an API?**

An application programming interface (API) is an interface with a set of rules that allows programs to talk to each other. APIs allow systems to communicate without requiring much technical knowledge about the communications channel. The result is that it is possible to build loosely coupled systems where components can interact with each other in a simpler way.



## 3.5 CONSIDERATIONS FOR DIGITAL DATA ANALYSIS AND USE

**Township departments can use digital data analysis to improve decision-making and evaluate policy interventions.** As noted in chapter 2, data-based analysis of local issues and policies is not yet common at the township level, but many departments could better discharge their core responsibilities and refine their policymaking with the help of digital data analysis. As local data collection focuses more on local issues, and

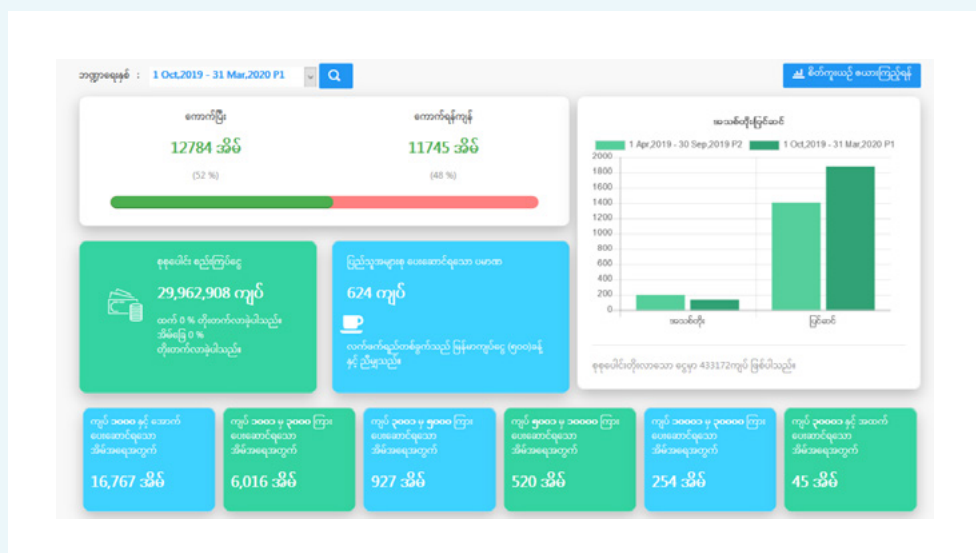
collection and storage are digitalized, a variety of simple analyses can be carried out to support decision-making, allowing township department officials, for example, to monitor key performance indicators or receive up-to-date data on revenue collection (box J). Where appropriate, and with resources and training, more complex policies can be addressed, such as route optimization for garbage collection.

### BOX J Myankhon Data-Analysis Dashboards

DAOs in Shan, Magway, Mon, and Kayin are taking advantage of data “dashboards” to monitor performance and make data-based decisions.

Data dashboards are a collection of data visualizations that provide critical information to decision-makers in easy-to-understand formats. They are typically displayed on a web page and are linked to databases that allow the dashboard to be updated in real time.

In Myanmar, data analysis skills are not common. Dashboards can be designed to do data analysis automatically, overcoming the need for government staff to do their own analysis with tools like Microsoft Excel. The Myankhon data-analysis dashboards were a response to difficulties officials had analyzing data with Excel. It takes a few staff to design the dashboard, and then it can be rolled out across the country.



The dashboard has been designed to illustrate statistical concepts, such as the distribution of data, without users having to understand those terms. The dashboard shows, at a glance, that the mean propertytax payment in Taunggyi is 624 kyat (just over the price of a cup of tea), with 68 percent of households paying less than 1,000 kyat every six months.

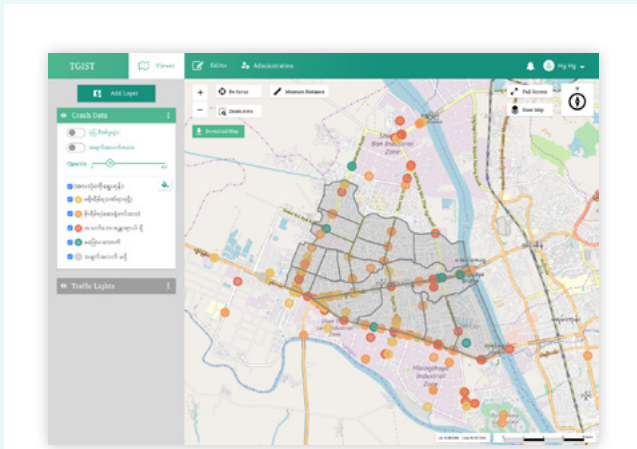
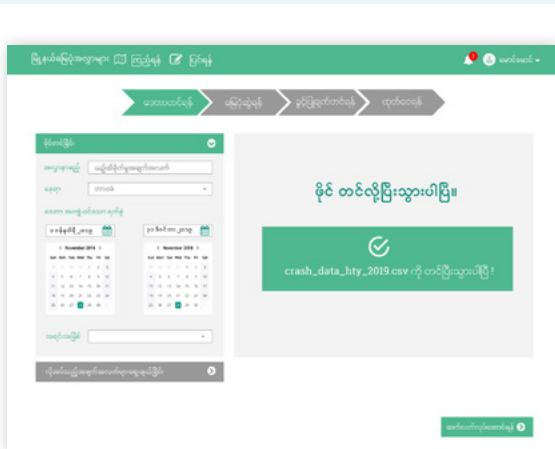
## BOX K The Township GIS Tool

Since 2017, Hlaingtharyar, Hpa An, and Taunggyi Township authorities and local residents have been working with development partners Thibi and The Asia Foundation to identify priority community-safety issues. The process of identifying issues through local-level engagement and dialogue, and collaboration between multiple government partners, led to the development of the Township GIS Tool (TGIST), a simple mapping tool to capture, analyze, and present data spatially.

The tool gives authorities a way to easily visualize and analyze their data. Unlike other information systems separately developed by different ministries, TGIST is not a repository of data that feeds back to the Union level. Instead, local authorities can jointly identify what kinds of data they need to solve a problem, upload just those datasets, and share them with other departments. As data from different local authorities is added and shared in the tool, it is possible to visualize different layers of information simultaneously—both the locations of streetlights and the sites of traffic collisions, for instance.

The tool can be used to quickly identify priority areas for response, such as hotspots for traffic collisions or high-crime areas, while also visually demonstrating the value of administrative data-collection efforts and the linkages between them. As the database has expanded, different levels of government have convened to discuss additional community issues, including drug prevention and tackling gender inequality. The success of TGIST has encouraged local authorities to improve the quality of their data—for instance, by disaggregating by age and sex.

The TGIST project has also increased community participation by validating data from both “formal” and “informal” residents. Local governments have no budget for services to unregistered, “informal” residents. As a result, shared services like garbage collection, water, and transport are overstretched, causing tensions between the two communities. A partnership between Yangon-based civil society organization Women for the World and local ward administrators to conduct “local-level safety audits” has brought together formal and informal residents to reach a shared understanding of the problems they face as a community. The data from these audits, fed into the TGIST database, helps local authorities understand the missing voices of communities and the valuable contribution they can make to collective problem solving. The project has produced a shift, albeit slight, to local governments providing services to informal as well as formal residents. In Hlaingtharyar Township, the local authorities have made garbage collection available in informal settlements.



**As township departments increasingly coordinate their problem-solving efforts, township officials will need to use data to clearly understand their community's needs.** While individual departments have their routine responsibilities, there are complex or “wicked” problems—problems with hard-to-understand causes—that require a coordinated response across the whole township administration. When combined with problem-solving approaches such as SARA (see box F), and digital data collection and storage, data shared across departments will paint a richer portrait of local issues and foster a shared understanding of the root causes of problems (see box K). The existing system of township committees provides an established forum for convening departments to discuss collaborative policymaking using shared data.

**As data quality improves, and the body of data on local problems grows, township administrations must be prepared to receive “bad news.”** As data collection focuses on what local communities really care about, and data-collection methods become more rigorous, collected data may give the impression that things are getting worse. This is a common side-effect of data-reform efforts everywhere. It can provoke pushback from leaders, who don’t want to be embarrassed by bad news. It can create a powerful incentive to dissemble in situations where data is used for performance management. But leaders must appreciate that understanding the true extent of a problem is essential to solving it, despite the superficial impression of failure. For example, improved data collection and interdepartmental sharing on the subject of road crashes might plausibly generate a spike in the number of reported crashes. But there haven’t been more crashes; authorities are just reporting more accurate numbers, which should allow them to develop more effective road-safety policies. Senior leaders should support township administrations that are trying to understand the extent and root causes of problems.

**Township-level analysis of digital data should have a clear purpose and a clear audience, and it should use readily available and easily understood tools.** Data analysis by township officials should support local decision-makers by focusing on local priorities or critical aspects of township administration. More efficient data collection carries the risk that “too much” data will overwhelm local analysts and decision-makers or generate more work for township departments. Additional skills and resources may be needed. While modern data-analysis tools have exciting capabilities, it’s unrealistic to expect township officials to instantly use complex statistical analysis tools. In the short term, local officials need to develop competence and confidence with tools like Excel, and to a body of routine skills and procedures for managing data so that it can be used for analysis and visualizations.

**Data visualizations are a powerful tool to communicate data analysis.** Complex and technical data analysis may be incomprehensible to policymakers with basic data-literacy skills. Data visualizations, like simple graphs of trends and outliers or the use of Geographic Information Systems (GIS) to present geographic or spatial data, are readily available tools that can build on the existing use of tabular data at the township level (see figure 3.3). Data dashboards can apprise decision-makers of the indicators most important to their work, without their needing to understand statistics to interpret the data. In Taunggyi, for example, municipal authorities revised the tax collection system after using a data dashboard to discover that the majority of households were paying less than 1,000 kyat biannually. Data communication and visualization tools should be tested and evaluated iteratively among township officials to be sure they are easy to use and understand.



**FIGURE 3.3** The potential benefits of visualizing data

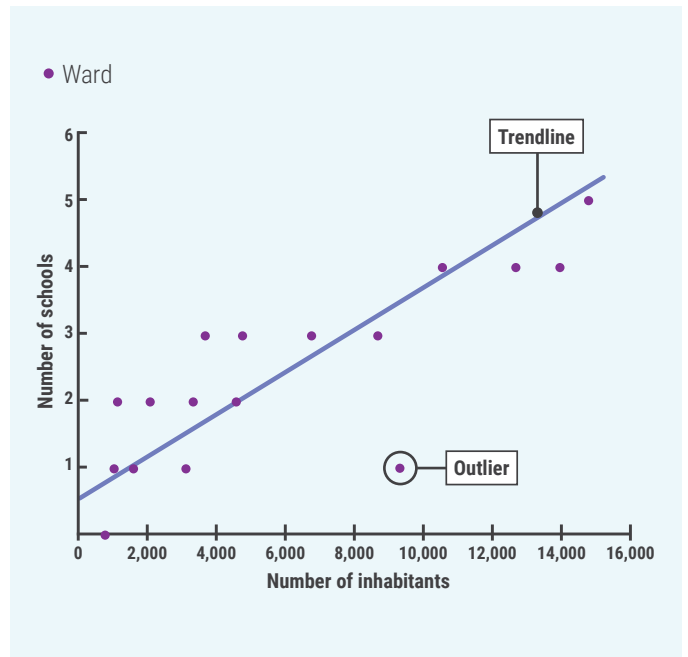
**TABLES**

Government data is commonly presented in tables and can be easily understood. The use of tables in Excel can facilitate simple manipulation of data such as ordering from highest to lowest.

Ward name	Number of inhabitants	Number of schools
Ward 1	1,200	2
Ward 2	1,000	1
Ward 3	900	0
Ward 4	14,000	4
Ward 5	1,800	1
Ward 6	2,100	2
Ward 7	3,500	2
Ward 8	4,400	2
Ward 9	13,400	4
Ward 10	11,300	4
Ward 11	9,100	3
Ward 12	9,700	1

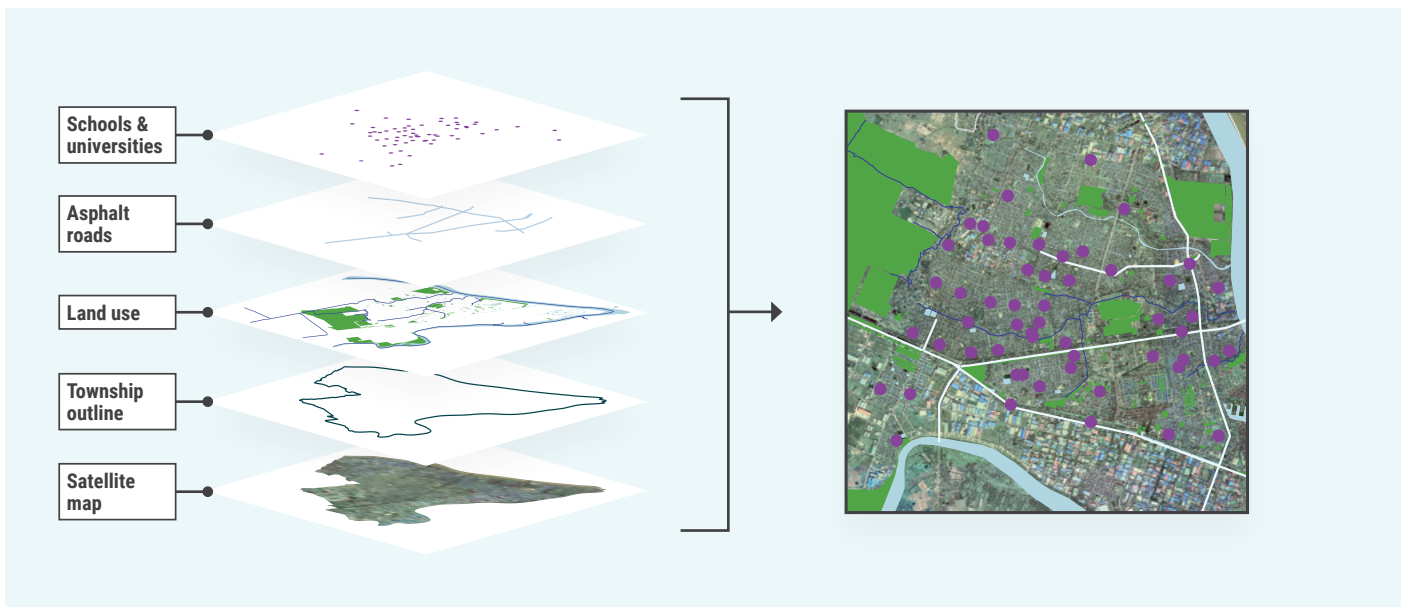
**CHARTS & GRAPHS**

Charts and graphs can help take information in tables and display them in a way that helps show trends and outliers, and give new insights. The graph below shows wards plotted as number of inhabitants against number of schools.



**MAPS**

Maps can help take information in tables and display them in a way that helps to reveal geospatial insights. The map below shows schools plotted by location, combined with other information layers: asphalt roads, land use, and satellite imagery of the urban area.





# ANNEX A

## OVERVIEW OF DATA COLLECTED AT THE LOCAL LEVEL, BY GOVERNMENT DEPARTMENT AND SECTOR

Township-Level Agency	Sector	Data
<b>Department for Development of Border Areas and National Races</b>	Multisector	Roads, water, irrigation, illegal-drugs control, education, training
<b>Department of Rural Development</b>	Multisector	Roads, electricity, water, rural development programs
<b>Development Affairs Organizations</b>	Multisector	Planning, water, sanitation, sewage, roads, bridges, disaster preparedness, property tax
<b>General Administration Department</b>	Multisector	Population registration, licensing and certification, land transfers, construction, taxes
<b>Department of Agricultural Land Management and Statistics</b>	Agriculture and land use	Farmland tax, land taxes, land and building transfers, surveys, maps, land use, agricultural statistics
<b>Department of Agriculture</b>	Agriculture	Crops, yields, areas under cultivation, extension-service records
<b>Department of Industrial Crops</b>	Agriculture	Crops and land use
<b>Myanma Economic Bank</b>	Banking	Banking
<b>Trade Promotion and Consumer Affairs Department</b>	Business and industry	Movement of commodities
<b>Cooperative Department</b>	Business and industry	Cooperative societies, business management statistics
<b>Department of Basic Education</b>	Education	Student registration, school data and locations, teacher and student counts
<b>Electricity Supply Enterprise</b>	Energy	Power distribution infrastructure, power plants, billing
<b>Department of Fisheries</b>	Fisheries	Aquaculture, licenses, taxes
<b>Department of Forestry</b>	Forestry	Forest products, licenses, taxes
<b>Department of Public Health and Department of Medical Services</b>	Healthcare	Health statistics, population statistics, healthcare center profiles, medical supplies
<b>Department of Traditional Medicine</b>	Healthcare	Registration, licensing
<b>Planning and Housing Department</b>	Housing	Housing permits, statistics
<b>Department of Immigration</b>	Demographic	Movement and location of individuals
<b>Public Works Department</b>	Infrastructure	National roads, bridges, government buildings, and airfields
<b>Department of Labor Relations</b>	Labor	Labor violations and disputes
<b>Department of Labor</b>	Labor	Workforce statistics
<b>Factory and General Labor Law Inspection Department</b>	Labor	Factory and labor law inspections
<b>Township Court</b>	Legal	Criminal law, civil law
<b>Information and Public Relations Department</b>	Libraries, public relations	Libraries, book clubs, literary festivals, community centers
<b>Livestock Breeding and Veterinary Department</b>	Livestock	Registration
<b>Department of Planning</b>	Planning	Land appraisal, planning, local economy
<b>Department of Population</b>	Demographic	Population statistics
<b>Department of Religious Affairs</b>	Religion	Religious statistics
<b>Department of Highways</b>	Roads	Highways, bridges, culverts, retaining walls



<b>Department of Rural Roads Development</b>	Roads	Roads, bridges, culverts
<b>Fire Services Department</b>	Security	Fires, losses
<b>Myanmar Police Force</b>	Security	Policing records
<b>Department of Sports and Physical Education</b>	Sports	Sports training, equipment
<b>Internal Revenue Department</b>	Taxation	Commercial and income taxes, stamp duties, and other revenues
<b>Posts and Telecommunications</b>	Telecommunications	Telecommunications infrastructure, post offices
<b>Trade Promotion and Consumer Affairs</b>	Trade	Trade prices
<b>Road Transportation Administration Department</b>	Transportation	Driver licensing, automobile licensing and inspection
<b>Transport Division of Operator License Supervision and Coordination</b>	Transportation	Commercial-vehicle licensing
<b>Irrigation and Water Utilization Management Department</b>	Water	Flood protection, irrigation, water infrastructure
<b>Department of Social Welfare</b>	Welfare	Welfare, social workers
<b>Social Security Board</b>	Welfare	Registrations, contributions, benefits, and claims

# ANNEX B

## GAD WARD / VILLAGE TRACT DATA COLLECTION FORMS

Form number	Title	Data collected
<b>Form 1(A)</b>	Population Statistics in Ward / Village Tract	Demographic statistics, including population totals by sex, adult/child, citizenship information
<b>Form 1(B)</b>	Population Moving in and Moving out of Ward / Village Tract	Demographic statistics, focusing on numbers of persons moving to and from ward / village tract
<b>Form 1(C)</b>	List of People Who Work in Distant Region	Demographic information, focusing on details of persons who have left ward / village tract to work elsewhere
<b>Form 2</b>	Birth Registration	Demographic information—birth registration
<b>Form 3</b>	Death Registration	Demographic information—death registration
<b>Form 4</b>	Guest Registration	Demographic information—guest registration
<b>Form 5(A)</b>	Table Showing Infrastructure	Local infrastructure information, including social and religious infrastructure
<b>Form 5(B)</b>	Table Showing Increase and Decrease in Infrastructure	Changes in local infrastructure information, including social and religious infrastructure
<b>Form 6</b>	Table Showing Works carried Out under Development Fund	Details of works using development funds, including community contribution and implementing agency
<b>Form 7</b>	Conditions of Manpower and Farming Tools	Details of agricultural workers and farming tools
<b>Form 8</b>	Table showing permitted land area for individual farmers	Details of “authorized farmers” and their land ownership broken down by types of arable land
<b>Form 9</b>	Crop Cultivation Condition	Details of currently cultivated crops, by acreage and field
<b>Form 10</b>	Quality Seeds Dissemination Condition	Details of the availability of quality seeds and cultivated crops
<b>Form 11</b>	List of Animal Disease Occurrence	Details of animal disease occurrences, symptoms, and numbers dead
<b>Form 12</b>	Fisheries	Details of types of fishery and number of workers
<b>Form 13</b>	List of Social/Economic Conditions	Form is “important as a list that can be easily reviewed for economic, social, and health conditions.” Includes demographic, agricultural, education, religious, and health data.
<b>Form 14</b>	List of Auxiliary Fire Brigade Members	Details of auxiliary fire brigade members
<b>Form 15(A)</b>	List of Red Cross Members	Details of Red Cross members
<b>Form 15(B)</b>	List of Maternal and Child Welfare Association Members	Details of Maternal and Child Welfare Association members
<b>Form 15(C)</b>	List of Women’s Affairs Federation Members.	Details of Women’s Affairs Federation members.
<b>Form 15(D)</b>	List of Other Social Organization Members	Details of members of other social organizations
<b>Form 16</b>	List of Schools and Students	Details of schools and students, by year cohort
<b>Form 17</b>	Activities of Staff Assigned to Ward/Village	Details of government staff assigned to ward/village and their activities in the ward/village
<b>Form 18</b>	Received Letter Registration Book	Details of letters received by ward/village-tract administrator and clerk
<b>Form 19</b>	Issued Letter Registration Book	Details of letters issued to other township departmental offices
<b>Form 20</b>	Registration Book for Dispatching Letters to and from the Region	Details of dispatched letters
<b>Form 21</b>	Office Equipment and Furniture Registration	Details of office equipment and furniture
<b>Form 22</b>	Registration Table for Visiting of Myanmar Police Force Officers	Details of visits from Myanmar Police Force officers and the assistance provided
<b>Form 23</b>	List of Serious Crimes Occurring	Details of “serious crimes,” such as murder, robbery, and rape
<b>Form 24(A)</b>	List of People from Ward / Village Tract who Fled to Jungle to Take Refuge	Details of persons who fled to jungle or disappeared
<b>Form 24(B)</b>	List of People who Entered the Legal Fold and Laid Down Their Arms	Details of persons who “entered the legal fold and laid down their arms”
<b>Form 25</b>	List of People Who are Subject to Bond and Bail Act	Details of persons who are subject to the Bond and Bail Act
<b>Form 26</b>	List of People Who Used to Live off Misdeeds	Details of persons who live off proceeds of misdeeds, such as robbery and narcotics
<b>Form 27</b>	List of People Who Have Previously Been Sentenced to Imprisonment	Details of persons who have previously been sentenced to imprisonment

# ANNEX C

## INFORMATION CONTAINED IN NCDDP VILLAGE DEVELOPMENT PLANS

NCDDP Village Development Plans provide data relating to village socioeconomic profile; current development situation; opportunities, barriers, and challenges; goals and strategies; and priority projects. NCDDP Village Development Plans contain:

1.	Township map
2.	Map of village tracts
3.	Villages within village tract
4.	Map (hand drawn) showing infrastructure within village
5.	Brief explanation of infrastructure map
6.	Brief history of village
7.	Definition of economic standards within village
8.	Brief explanations on economic standards
9.	Male/female spider web showing "health, household chores, decision making, leads, security, work opportunity, education, wage"
10.	Brief explanations on male/female spider web
11.	Map showing the linkage of local communities, NGOs and government departments
12.	Brief explanations on linkage map
13.	Seasonal calendar showing the agriculture, access to village, local festivals and seasonal fevers
14.	Brief explanations on seasonal calendar
15.	List and photo of local community members
16.	Photos of village development meetings/projects
17.	Village basic facts, showing population, infrastructure, village access, village development plans, distance to center of village tract, possible natural-disaster types
18.	Prioritized development plans (for 4 <sup>th</sup> year) <ul style="list-style-type: none"> <li>• Village development expectations for next 5 years</li> <li>• Village development plans for next 4 years which are in line with CDD's projects</li> <li>• Village development plans for next 4 years which are not in line with CDD's projects</li> </ul>
19.	Prioritized development plans (for 3 <sup>rd</sup> year) <ul style="list-style-type: none"> <li>• Village development expectations for next 5 years</li> <li>• Village development plans for next 4 years which are in line with CDD's projects</li> <li>• Village development plans for next 4 years which are not in line with CDD's projects</li> </ul>
20.	Prioritized development plans (for 2 <sup>nd</sup> year) <ul style="list-style-type: none"> <li>• Village development expectations for next 5 years</li> <li>• Village development plans for next 4 years which are in line with CDD's projects</li> <li>• Village development plans for next 4 years which are not in line with CDD's projects</li> </ul>
21.	Prioritized development plans (for 1 <sup>st</sup> year) <ul style="list-style-type: none"> <li>• Village development expectations for next 5 years</li> <li>• Village development plans for next 4 years which are in line with CDD's projects</li> <li>• Village development plans for next 4 years which are not in line with CDD's projects</li> </ul>
22.	Table showing prioritized projects by sectors for the village
23.	Meeting notes
24.	Table showing brief descriptions of all of the above topics with dates

# ENDNOTES

1. Guay 2018
2. Ministry of Planning and Finance 2018, 14.
3. Stagan 2016.
4. World Bank Statistical Capacity Indicators. Statistical Capacity Indicators can be accessed at: <https://databank.worldbank.org/source/statistical-capacity-indicators>.
5. E-government can be defined as “the use of ICT and the internet to enhance the access to and delivery of all facets of government services and operations for the benefit of citizens, businesses, employees, and other stakeholders.” Silcock 2001.
6. *Myanmar Times*, Feb. 20, 2020.
7. Smart cities can be defined as “places where information technology is combined with infrastructure, architecture, everyday objects, and even our bodies to address social, economic, and environmental problems.” Townsend 2014.
8. Si Thu Lwin 2018.
9. Myanmar is currently 157 of 193 countries in the UN E-government survey. United Nations 2018.
10. According to a US survey of ICT projects, government projects had a dismal 18 percent success rate. Goldfinch 2007.
11. The Asia Foundation’s Accountable and Inclusive States and Regions project works to strengthen Myanmar’s subnational governments and civil society so that they can better respond to the needs of the Myanmar people through more peaceful, inclusive, responsive, and democratic governance. The Foundation’s Urban Safety Project supports the country’s nascent transition to democracy by increasing the effectiveness and responsiveness of security-related actors at the township level in addressing people’s urban safety needs. The Foundation has also developed the Township Development Indicators database. The database provides a rich repository of data at the township level, combining over 6,500 indicators across 11 categories.
12. For a more detailed explanation of the local governance system, please see Batcheler 2018.
13. More details of the National Statistical System are available at: <https://www.csostatat.gov.mm/AboutCSO/StatisticalSystem>.
14. Central Statistical Organization 2016.
15. Ministry of Planning and Finance 2018.
16. More details of the Central Statistical Organization’s aim and mission are available at: <https://www.csostatat.gov.mm/>.
17. Central Statistical Organization 2016.
18. *Ibid.*, 7.
19. *Ibid.*
20. *Ibid.*
21. Htoo Thant 2019.
22. Ministry of Transport and Communications 2017.
23. Central Statistical Organization 2016, 10.
24. Ministry of Immigration and Population 2015.
25. *Ibid.*
26. This practice is, in part, a legacy of colonial rule and the importance that colonial authorities attached to enumerating and targeting their subjects. Ittmann et al. 2010.
27. Bissinger 2019.
28. Open Development Myanmar 2016.
29. *Ibid.*
30. *Ibid.*
31. Ferguson 2018.
32. Caeyers et al. 2010.
33. Ministry of Health and Sports 2019.
34. Myint Aung Hlaing 2017.
35. For an overview of the information contained in the 27 forms, please see annex B.
36. Village development plans have been developed under the DRD and World Bank’s National Community-Driven Development Project (NCDDP; visit <https://cdd.drdmyanmar.org/en> for further information), and through the Village Development Planning project led by DRD and supported by the Livelihoods and Food Security Trust Fund (LIFT) (visit <http://vdp.drdmyanmar.org/en/about-vdp> for further information).
37. Runde 2017.
38. The Myanmar Statistical Yearbooks can be found at: <https://www.mopfi.gov.mm/en/page/planning/central-statistical-organization-cso/752>. Selected Monthly Economic Indicators can be found at: <https://www.mopfi.gov.mm/en/page/planning/central-statistical-organization-cso/748>.
39. For a more detailed description of how evidence is used to inform local investment planning prioritization, see Batcheler 2019.
40. For example, the introduction of Thailand’s “smart” ID cards was perceived as a failure. <https://www.securityinfowatch.com/government/news/10593099/thailands-pricey-id-cards-fail-smart-test>.
41. According to Saunders and Baeck (2015), the first of four flaws with visions for smart cities is starting with the technology rather than with the urban challenges.
42. For further information on the UK’s Office for National Statistics, please see <https://www.ons.gov.uk/>.
43. ISO/IEC 27001:2013 (<https://www.iso.org/standard/54534.html>) and ISO/IEC 27002:2013 (<https://www.iso.org/standard/54533.html>).
44. Ministry of Health and Sports 2016a, 13.
45. Ministry of Health and Sports 2017, 11.
46. Ministry of Health and Sports 2016b, 7.
47. Snow 2019.
48. Saw Yi Nanda 2019.

# REFERENCES

- Batcheler, R. 2018. *State and Region Governments in Myanmar*. New edition. Yangon: The Asia Foundation.
- Batcheler, R. 2019. *Where Top-Down Meets Bottom-Up: Planning and Budgeting in Myanmar*. Yangon: The Asia Foundation.
- Bissinger, J. 2019. *Myanmar's Economic Governance Actors*. Yangon: The Asia Foundation.
- Caeyers, B., N. Chalmers, and J. De Weerd. 2010. *A Comparison of CAPI and PAPI through a Randomized Field Experiment*. [http://siteresources.worldbank.org/INTLSMS/Resources/3358986-1199367264546/Caeyers\\_Chalmers\\_DeWeerd\\_CAPIvsPAPI.pdf](http://siteresources.worldbank.org/INTLSMS/Resources/3358986-1199367264546/Caeyers_Chalmers_DeWeerd_CAPIvsPAPI.pdf).
- Central Statistical Organization. 2016. "National Strategy for Development of Statistics. Part One: Core Strategies (draft)."
- Ferguson, K. 2018. "3 Myths About Paper-Based Data Collection." *Humans of Data*, November 6. <https://humansofdata.atlan.com/2018/11/myths-paper-based-data-collection/>.
- Goldfinch, S. 2007. "Pessimism, Computer Failure, and Information Systems Development in the Public Sector." *Public Administration Review* 67 (5): 917–929.
- Guay, Jennifer. 2018. "Evidence-based policymaking: is there room for science in politics?" *Apolitical*, Oct. 7. [https://apolitical.co/en/solution\\_article/evidence-based-policymaking-is-there-room-for-science-in-politics](https://apolitical.co/en/solution_article/evidence-based-policymaking-is-there-room-for-science-in-politics).
- Htoo Thant. 2019. "Japan helps Myanmar to enact cybersecurity law." *Myanmar Times*, January 15. <https://www.mmmtimes.com/news/japan-helps-myanmar-enact-cybersecurity-law.html>.
- Ittmann, K., D. Cordell, and G. Maddox. 2010. *The Demographics of Empire: The Colonial Order and the Creation of Knowledge*. Athens, Ohio: Ohio University Press.
- Ministry of Health and Sports. 2016a. *Myanmar National Health Plan 2017–2021*.
- Ministry of Health and Sports. 2016b. *Review of DHIS2 implementation experience: Findings and Lessons Learnt*.
- Ministry of Health and Sports. 2017. *Strategic Action Plan for Strengthening Health Information 2017–2021*.
- Ministry of Health and Sports. 2019. *Role of Tablets in Data Compilation, Reporting and Research*. <https://event-mohs.gov.mm/wp-content/uploads/2019/10/Roles-of-Tablets-in-Data-Compilation-Reporting-and-Research-22-10-2019.pdf>.
- Ministry of Immigration and Planning. 2015. *The 2014 Myanmar Population and Housing Census*.
- Ministry of Planning and Finance. 2018. *Myanmar Sustainable Development Plan (2018–2030)*. [https://themimu.info/sites/themimu.info/files/documents/Core\\_Doc\\_Myanmar\\_Sustainable\\_Development\\_Plan\\_2018\\_-\\_2030\\_Aug2018.pdf](https://themimu.info/sites/themimu.info/files/documents/Core_Doc_Myanmar_Sustainable_Development_Plan_2018_-_2030_Aug2018.pdf).
- Ministry of Transport and Communications. 2017. *Myanmar e-Governance Master Plan (2016–2020)*, Draft. <https://www.motc.gov.mm/my/news/myanmar-e-government-master-plan>.
- Myanmar Times*. 2020. "e-Government system crucial for country's development: State Counsellor." February 20. <https://www.mmmtimes.com/news/e-government-system-crucial-countrys-development-state-counsellor.html>.
- Myint Aung Hlaing. 2017. "Two YBS buses offer free WiFi to conduct survey." *7Day News*, June 14. <https://7day.news/story/98968>.
- Open Development Myanmar website. 2016. "Land." Accessed March 19, 2020. <https://opendevelopmentmyanmar.net/topics/land/>.
- Runde, D. 2017. "The Data Revolution in Developing Countries Has a Long Way to Go." *Forbes*, February 25. <https://www.forbes.com/sites/danielrunde/2017/02/25/the-data-revolution-in-developing-countries-has-a-long-way-to-go/#114becfe1bfc>.
- Saunders, T., and P. Baeck. 2015. *Rethinking Smart Cities from the Ground Up*. Nesta. <https://www.nesta.org.uk/report/rethinking-smart-cities-from-the-ground-up/>.
- Saw Yi Nanda. 2019. "Tackling city issues with tech." *Myanmar Times*, August 27. <https://www.mmmtimes.com/news/tackling-city-issues-tech.html>.
- Silcock, R. 2001. "What is e-Government?" *Parliamentary Affairs* 54 (1).
- Si Thu Lwin. 2018. "Mandalay to finish new traffic light system." *Myanmar Times*, March 9. <https://www.mmmtimes.com/news/mandalay-finish-new-traffic-light-system.html>.
- Snow, T. 2019. "Mind the gap between the truth and data." *Nesta blog*, October 29. <https://www.nesta.org.uk/blog/mind-gap-between-truth-and-data/>.
- Stagan, M. 2016. *Data Quality in Southeast Asia: Analysis of Official Statistics and Their Institutional Framework as a Basis for Capacity Building and Policy Making in the ASEAN*. Palgrave Macmillan.
- Townsend, A. 2014. *Smart Cities*. New York: W.W. Norton.
- United Nations. 2018. *E-Government Survey 2018: Gearing E-Government to Support Transformation Towards Sustainable and Resilient Societies*. New York: United Nations. [https://publicadministration.un.org/Portals/1/Images/E-Government%20Survey%202018\\_FINAL%20for%20web.pdf](https://publicadministration.un.org/Portals/1/Images/E-Government%20Survey%202018_FINAL%20for%20web.pdf).



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The Asia Foundation is a nonprofit international development organization committed to improving lives across a dynamic and developing Asia. Informed by six decades of experience and deep local expertise, our work across the region addresses five overarching goals—strengthen governance, empower women, expand economic opportunity, increase environmental resilience, and promote international cooperation.

To request copies of the report, please contact [myanmar.general@asiafoundation.org](mailto:myanmar.general@asiafoundation.org). We also welcome your feedback on the report.