

# Data Management for Evidence-Based Policymaking (DMEP) in Federalism: A Policy Position Paper

Prof. Chandra P. Rijal, PhD

Executive Director, Planning, Development, and Monitoring Directorate | Research  
Directorate, Coordinator, MU Policy Lab | Professor of Management Sciences, Graduate  
School of Management, Mid-West University, Nepal

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## Abstract

This paper attempts to explore the intricate relationship between federalism and data management within Nepal, with a focus on the realities of Karnali Province. As Nepal transitions into a federal structure, effective data management becomes crucial for informed decision-making and impactful policies. The paper proposes a comprehensive framework to enhance evidence-based policymaking at local, provincial, and federal levels. Utilizing a mixed-method approach, the study reviews existing literature, analyzes current data practices in Nepal, and incorporates global best practices. Primary data was gathered through interviews and surveys with key stakeholders in Karnali Province. The findings reveal significant gaps in data infrastructure, human resource capabilities, and institutional frameworks, which impede effective data collection, analysis, and dissemination. Drawing from international models, the paper underscores the need to strengthen data infrastructure, build local capacity, and foster inter-governmental collaboration. Recommendations for local governments include establishing data management units and training staff. At the provincial level, the creation of a Provincial Data Management Authority and standardized data collection mechanisms are advocated. For the federal government, the paper recommends developing national data management policies, facilitating data-sharing platforms, and supporting capacity-building initiatives. In conclusion, the paper emphasizes the critical role of data management in federalism's success in Nepal. By adopting the proposed framework and recommendations, Nepal can leverage data to drive development and improve governance, particularly in regions like Karnali Province. The strategic interventions aim to establish a culture of data-driven decision-making, ensuring policies and programs effectively meet citizens' needs.

**Keywords:** Data management, Evidence-Based Policymaking, Federalism, Governance.

### Purpose, Scope, and Methodology of Work

The purpose of this paper is to develop and propose a comprehensive framework for data management to enhance evidence-based policymaking within the federal structure of Nepal, focusing particularly on Karnali Province. As Nepal transitions to a federal system, the efficient management of data is essential for crafting and executing policies that address the diverse needs at local, provincial, and national levels. More specifically, this paper aims to:

- a. **Explore the Developing Context and Highlight Evolving Opportunities:** Investigate the potential opportunities offered by digital technologies and innovative practices for improving data management. This includes examining global best practices and assessing their adaptability to the unique context of Karnali Province.
- b. **Identify Policy and Program-Level Challenges and Gaps:** Assess the current state of data management in Karnali Province, pinpointing key challenges and gaps in data infrastructure, human resource capabilities, and institutional frameworks that impede effective data collection, storage, analysis, and dissemination.
- c. **Provide Policy Recommendations:** Formulate tailored recommendations for local, provincial, and federal governments to establish a cohesive and integrated data ecosystem. These recommendations will focus on strengthening data infrastructure, building local capacity, and promoting inter-governmental collaboration.
- d. **Support Evidence-Based Policymaking:** Advocate for the establishment of robust data management systems to support evidence-based policymaking. Highlight the importance of reliable data for diagnosing issues, formulating strategies, evaluating outcomes, and fostering transparency and accountability in governance.

In terms of scope of work, this paper encompasses a broad examination of data management practices and their implications for evidence-based policymaking within Nepal's federal context. The working scope includes:

- a. **Desk review:** Conducted a comprehensive review of existing literature on federalism and data management, establishing a theoretical foundation for understanding the interplay between governance structures and data utilization.
- b. **Case Studies and Global Best Practices:** Analyzed successful data management models from various federal systems globally, identifying practices that could be adapted to the Nepali context.
- c. **Primary Data Collection:** Gathered insights through focus groups, panels, interviews and surveys with key stakeholders in Karnali Province to gain a grounded perspective on local realities and challenges.
- d. **Policy Analysis:** Critically evaluated current data practices and policies in Nepal to identify strengths and areas for improvement.
- e. **Ways Forward:** Developed detailed and actionable recommendations tailored to the specific needs of local, provincial, and federal governments, aimed at enhancing data management and supporting evidence-based policymaking.

To achieve the objectives of this paper, a multi-method approach was employed while crafting this paper. A thorough review of the literature on data management, evidence-based policymaking, and federalism was accomplished to establish a theoretical framework for the

paper. Examination of international best practices and successful data management models provide insights into effective strategies that can be adapted to Nepal's federal context.

Insights from interviews and surveys with stakeholders in Karnali Province provide an empirical basis for understanding local challenges and needs. The paper includes the key findings of a recent research conducted by the MU Policy Lab entitled *Informing Evidence-based Policymaking*. A review of policy documents, reports, and international best practice case studies relevant to data management and federalism in Nepal supported significantly in coming up with this paper in the present shape and content.

Analysis of relevant policy documents, reports, and case studies support the identification of gaps and opportunities in current data management practices. Combining the findings from the literature review, case studies, primary data, and policy analysis, actionable recommendations are formulated to enhance data management and support evidence-based policymaking in Nepal. With these all, the paper aims to contribute to the development of a strategic framework for data management in Nepal, fostering a culture of data-driven decision-making that enhances governance and development outcomes, with a particular focus on Karnali Province.

### **Background and Context**

Nepal's shift to a federal governance structure introduces significant opportunities, challenges, and complexities in data management, crucial for effective policymaking and implementation. It is a universal practice that the federal systems require robust mechanisms for data collection, analysis, and utilization to support informed decision-making across multiple governance levels (Alesina & Spolaore, 2003). In this connection, Heller (2017) observes that the need for enhanced data management is underscored by the requirement to integrate data from local, provincial, and federal levels to create coherent policies and programs.

In the context of Karnali Province, the challenges are accentuated by its unique socio-economic and geographical characteristics. Karnali is one of Nepal's most remote and underdeveloped regions, which affects its data infrastructure and capacity (Bhattarai, 2020) hindering the pace of creating and promoting an informed culture of decision-making. Effective data management in such settings requires addressing gaps in infrastructure, improving data collection methods, and building local capacities to handle and analyze data (United Nations Development Programme [UNDP], 2019). These challenges necessitate a strategic framework that aligns with federal goals while accommodating regional specifics.

At the same time, there are opportunities too. For instance, the adoption of digital technologies offers significant potential for enhancing data management in a geospatially diverse region like Karnali Province. According to the World Bank, leveraging digital tools can streamline data collection, improve data accuracy, and facilitate real-time data sharing between different government levels (World Bank, 2021). Such digital transformation can also support the development of e-governance systems, which have been shown to improve service delivery and citizen engagement in various contexts (United Nations Economic and Social Commission for Asia and the Pacific [UNESCAP], 2019). Furthermore, initiatives such as

the Digital Nepal Framework highlight the government's commitment to integrating technology in governance, which can provide a strong foundation for building robust data management systems (Ministry of Communication and Information Technology [MoCIT], 2019). The technological advancements, combined with targeted investment in infrastructure and capacity building at the individual and institutional levels, present a unique opportunity to overcome the data management challenges in Karnali Province and foster a culture of data-driven decision-making.

Bird (2008), argues that navigating data management in a federal system involves bridging gaps between different administrative levels to ensure that data supports evidence-based policymaking. According to Kane (2019), efficient coordination and data sharing between local, provincial, and federal governments are essential to enhance policy effectiveness and ensure that decisions are grounded in reliable evidence. Strengthening these systems in Karnali Province is critical for developing policies that address local needs while fitting within the broader national framework.

Let us also explore the significance of this responsible initiative concerning the developing context of Karnali Province at large. Effective data management is paramount in contemporary policymaking, providing the foundation for decisions that are evidence-based, transparent, and accountable. As policymakers confront increasingly complex societal challenges, reliable data becomes indispensable for diagnosing issues, formulating strategies, and evaluating outcomes. High-quality data enables governments to allocate resources efficiently, design targeted interventions, and monitor progress against defined objectives. This empirical approach to governance enhances the effectiveness of public policies and builds public trust by demonstrating that decisions are grounded in factual evidence rather than conjecture or political expediency (Organization for Economic Cooperation and Development [OECD], 2017). In the context of federalism, robust data management is particularly crucial as it facilitates coordination and coherence across multiple levels of government. Effective data systems enable local, provincial, and federal governments to harmonize their efforts, ensuring that policies are consistent and mutually reinforcing. For instance, standardized data collection and sharing protocols allow for comprehensive analyses that can identify regional disparities and tailor interventions accordingly (Khan & Park, 2013). Moreover, data-driven policymaking promotes accountability by providing benchmarks and performance metrics that can be monitored and evaluated across different government tiers. This not only helps in optimizing policy implementation but also in fostering a culture of continuous improvement and responsiveness to the needs of the populace (United Nations, 2018).

In Nepal, the importance of data management is recognized in various governmental and developmental initiatives. For instance, the Government of Nepal, in collaboration with development partners, has been working on strengthening its National Statistical System to ensure the availability and use of high-quality data for policy and planning purposes (Central Bureau of Statistics [CBS], 2019). The Digital Nepal Framework also emphasizes the importance of data in driving development and improving governance across the country (Ministry of Communication and Information Technology [MoCIT], 2019).

### Federalism in Nepal

As we have already discussed above, Nepal's transition to federalism marks a significant shift in its governance structure, aimed at decentralizing power and ensuring more equitable development across its diverse regions. Federalism in Nepal involves the division of the country into seven provinces, each with its own government, alongside local governments and the federal government. This multi-tiered system is designed to bring governance closer to the people, fostering greater participation and responsiveness (Constitution of Nepal, 2015).

The move towards federalism in Nepal is rooted in the country's complex history of political evolution and social movements. Historically, Nepal was a unitary state with a centralized government. The demand for federalism gained momentum during the Maoist insurgency between 1996-2006, which highlighted issues of ethnic marginalization and regional disparities (Hachhethu, 2007). The Comprehensive Peace Agreement in 2006 and subsequent political developments paved the way for the adoption of a federal system structure. The Interim Constitution of 2007 and the final Constitution of 2015 formalized federalism, aiming to address long-standing demands for inclusiveness and balanced regional development (International Crisis Group, 2016).

Nepal's federal structure comprises three levels of government -- federal, provincial, and local. The federal government retains powers related to national defense, foreign policy, and monetary policy. The seven provinces have jurisdiction over areas like education, health, and infrastructure within their regions, while local governments are responsible for local development activities and public services (Constitution of Nepal, 2015).

Each province has a provincial assembly and executive headed by a Chief Minister. Local governments consist of municipalities and rural municipalities, each with elected councils and executive officers. This structure is intended to promote local autonomy and ensure that development efforts are tailored to the specific needs of different regions (Asian Development Bank, 2019).

The implementation of federalism in Nepal faces several challenges that primarily include capacity building, resource allocation, coordination and collaboration, and policy harmonization. The challenges for Karnali Province are not different from that of the nation.

- a. **Institutional Capacity:** Building the capacity of provincial and local governments to manage their new responsibilities effectively remains a significant challenge. Many regions lack the necessary administrative infrastructure and skilled personnel (United Nations Development Programme [UNDP], 2019).
- b. **Resource Allocation:** Ensuring equitable distribution of resources among provinces and local governments is complex. There are concerns about disparities in revenue generation and access to federal funds, which can lead to tensions between different levels of government (World Bank, 2018).
- c. **Coordination and Collaboration:** Effective federal governance requires robust mechanisms for coordination and collaboration between different levels of

government. In practice, there have been issues related to overlapping responsibilities and jurisdictional disputes (Bhurtel, 2019) in Nepal.

- d. **Policy Harmonization:** Aligning policies across federal, provincial, and local levels is critical for coherent and responsive governance. However, inconsistencies and gaps in policy implementation can undermine development efforts (Adhikari, 2020).

Despite these challenges, federalism presents several opportunities in the national and subnational context of Nepal. Hopefully, a few of such opportunities or prospects may include as follows:

- a. **Local Empowerment:** Federalism empowers local communities by giving them greater control over development decisions (Asian Development Bank, 2019), which can lead to more responsive and effective governance, addressing local needs and priorities.
- b. **Inclusive Development:** The federal structure aims to promote inclusive development by ensuring that marginalized groups and regions receive attention and resources (International Crisis Group, 2016), which can help reduce historical disparities and foster social cohesion.
- c. **Innovation in Governance:** Federalism encourages innovation and experimentation in governance (Khanal, 2020) whereby the provincial and local governments can develop and implement policies that are tailored to their unique contexts, potentially leading to more effective solutions.
- d. **Increased Accountability:** Decentralization enhances accountability by bringing government closer to the people, advocates the United Nations (2018) with an argument that the citizens can more easily monitor and influence government actions, leading to improved transparency and public trust.

### Data Management for Evidence-Based Policymaking

Effective data management is pivotal for evidence-based policymaking globally. High-quality data is essential for making informed decisions, crafting targeted interventions, and evaluating policy outcomes. In this respect, the OECD (2017) argues that robust data systems are foundational for transparency, accountability, and efficiency in governance. For example, countries such as the United States, the United Kingdom, and Canada have developed comprehensive data management frameworks that integrate data collection, analysis, and dissemination processes, thereby facilitating evidence-based decisions across various sectors (OECD, 2019). The Office for National Statistics (ONS) in the UK provides accessible, reliable, and up-to-date statistical information used by policymakers to address issues ranging from public health to economic development (ONS, 2020). Similarly, the Federal Data Strategy in the United States outlines a coordinated approach to leveraging data as a strategic asset, promoting practices that ensure the accessibility, quality, and usability of federal data (Federal Data Strategy, 2020).

According to the World Bank (2020), best practices in data management for evidence-based policymaking involve ensuring data quality, accessibility, integration, and security. Data quality implies that the data must be accurate, timely, and relevant. Accessibility involves making data easily available to policymakers, researchers, and the public. Integration refers to combining data from different sources to provide a comprehensive view of the issue at

hand. Finally, data security ensures that sensitive information is protected from unauthorized access and breaches.

New Zealand's Integrated Data Infrastructure (IDI) exemplifies successful data integration by linking data from various government agencies to provide insights that help shape social and economic policies. This integrated approach allows for a holistic understanding of complex issues, enabling more effective interventions (Statistics New Zealand, 2020). Furthermore, the European Union's General Data Protection Regulation (GDPR) sets a high standard for data security, ensuring that data is handled responsibly and with respect for privacy rights (European Commission, 2020).

In Nepal, data management is gaining recognition as a critical component of evidence-based policymaking. The Central Bureau of Statistics (CBS) is the primary government agency responsible for collecting, analyzing, and disseminating statistical data. However, challenges such as limited infrastructure, insufficient funding, and a lack of skilled personnel hinder effective data management practices (CBS, 2019).

The Digital Nepal Framework aims to address these challenges by promoting the use of digital technologies in data management. This initiative seeks to enhance data collection, storage, and analysis capabilities across various sectors, thereby improving the quality and availability of data for policymaking (MoCIT, 2019). Collaboration with international organizations such as the World Bank and the UNDP has also led to capacity-building projects aimed at strengthening Nepal's data management systems (World Bank, 2018; UNDP, 2019).

Despite these initiatives, several challenges persist in Nepal's data management landscape. The fragmented nature of data systems, with multiple agencies collecting data independently, often leads to inconsistencies and gaps. There is also a lack of standardized protocols for data collection and sharing, which hampers data integration and the creation of a unified data ecosystem. Moreover, the digital divide, particularly in rural and remote areas, limits the ability to leverage digital tools for data management (Adhikari, 2020; Bhurtel, 2019).

However, significant opportunities for improvement exist. The adoption of geospatial technologies, such as Geographic Information Systems (GIS), can enhance data accuracy and provide valuable insights for regional planning and development. Investing in human resource development by training data professionals and fostering a culture of data literacy can also greatly improve data management practices. Furthermore, creating a centralized data repository that integrates data from various sources can facilitate more comprehensive and informed policymaking (Khanal, 2020).

To move forward, Nepal must prioritize developing a robust data management framework that supports evidence-based policymaking. This involves investing in technological infrastructure, fostering inter-agency collaboration, and creating standardized data protocols. Implementing policies that ensure data quality, accessibility, and security is essential for building a trustworthy data ecosystem (World Bank, 2020).

Collaboration with international partners can also provide valuable support in terms of technical expertise and funding. Learning from global best practices and adapting them to the Nepalese context can help overcome existing challenges and unlock the full potential of data for driving development and improving governance. By strengthening its data management systems, Nepal can ensure that policies are based on reliable evidence, ultimately leading to more effective and impactful interventions for its citizens (UNDP, 2019). Considering these regional, national, and global realities, the Mid-West University Policy Lab has already stepped into an initiative of setting up the Karnali Data Bank for the use of all. At present, MU Policy Lab has been exploring a sustainable partnership for this initiative.

A more recent study in the Nepalese context has confirmed that effective database management systems (DBMS) are fundamental to the success of multi-level governance, providing the data needed for informed decision-making and accountability. This study has indicated that enhancing digital literacy and establishing systems compatible with dynamic institutional architectures will support the effective implementation of the development goals. In this study, Breen and Thomas (2024) have suggested that measures should be put in place to improve the accessibility and usability of data, ensuring that it can be leveraged to enhance governance outcomes. According to these scholars, developing platforms for data sharing and transparency will facilitate greater accountability and inclusiveness, enabling better coordination among different levels of government and between governmental and non-governmental actors.

### **Key Issues and Considerations of DMEP**

Effective data management is foundational for evidence-based policymaking, particularly in the context of federal systems like Nepal. As governments increasingly rely on data for an informed approach to policy decisions, understanding and addressing the key issues and considerations in data management become crucial. These issues span across multiple dimensions, including data quality and standardization, accessibility and sharing, technological infrastructure, privacy and security, and the establishment of robust policy and institutional frameworks. By examining these aspects through a balanced lens of regional, national, and international experiences, we can identify best practices and strategies to enhance data management systems and support effective governance.

- a. **Data Quality and Standardization:** Ensuring high data quality and standardization is crucial for effective evidence-based policymaking. Discrepancies in data collection methods and a lack of standardized protocols can undermine the reliability of policy decisions. The World Bank emphasizes the need for standardized data collection practices to ensure consistency and reliability across various regions and sectors (World Bank, 2021). In Nepal, the Central Bureau of Statistics (CBS) has been working towards improving data quality, yet challenges persist, particularly in remote areas where data collection infrastructure is limited (CBS, 2019).
- b. **Data Accessibility and Sharing:** Data accessibility and sharing are essential for creating a collaborative environment among government agencies and stakeholders. Open data policies promoting public access to data can enhance transparency and encourage broader participation in policy analysis and development. The United Nations Sustainable Development Goals (SDGs) highlight the importance of open data

for governance and development (United Nations, 2015). In Nepal, initiatives like the Digital Nepal Framework aim to improve data accessibility and facilitate inter-agency data sharing to support evidence-based policymaking (MoCIT, 2019).

- c. **Technological Infrastructure and Capacity Building:** Robust technological infrastructure and capacity building are vital for effective data management. Investment in modern data management systems, such as cloud computing and data analytics platforms, can significantly enhance governments' ability to collect, store, and analyze large volumes of data. The OECD highlights the role of digital technologies in transforming data management practices and improving public service efficiency (OECD, 2019). In Nepal, while there has been progress in adopting digital tools and technologies, ongoing investment in infrastructure and training programs is necessary to build technical capacity (World Bank, 2018).
- d. **Privacy and Security Concerns:** Privacy and security are critical considerations in data management. Protecting sensitive information from unauthorized access and breaches is essential to maintain public trust and ensure ethical data use. The European Union's General Data Protection Regulation (GDPR) sets a high standard for data protection, emphasizing the need to secure personal data and uphold privacy rights (European Commission, 2020). In Nepal, data privacy laws are evolving, and there is an increasing recognition of the need to align with international best practices to safeguard data (MoCIT, 2019).
- e. **Policy and Institutional Frameworks:** Strong policy and institutional frameworks are essential for effective data management. National data strategies, like those implemented in countries such as the United States and the United Kingdom, provide comprehensive approaches to managing data as a strategic asset (Federal Data Strategy, 2020; ONS, 2020). In Nepal, developing a cohesive national data policy is crucial for coordinating efforts across different government levels and ensuring that data management practices align with broader development goals (CBS, 2019).

Addressing these key issues and considerations is fundamental to establishing a robust data management system that supports evidence-based policymaking. By focusing on data quality, accessibility, technological infrastructure, privacy, and policy frameworks, Nepal can build a data ecosystem that enhances governance and drives development. International experiences and best practices offer valuable insights that can be adapted to the Nepalese context, ensuring that data is effectively utilized to meet the needs of its citizens.

### **Concurrent Research in Karnali - Informing Evidence-based Policymaking**

As part of comprehensive concurrent research entitled 'Informing Evidence-based Policymaking' being conducted by the MU Policy Lab, the information collected through a series of key informant interviews (KIIs), focus group discussions (FGDs), community dialogues, and physical observation in Birendranagar Municipality, Surkhet, and Chaurjahari Municipality, Rukum-West, the following genesis of the qualitative observation has been derived (Rijal et al., 2024).

This study recognized that comprehensive data collection and analysis are essential for understanding service delivery outcomes and identifying gaps. This enables policymakers to make informed decisions based on accurate and detailed information, improving service

effectiveness. In this respect, the findings of the comprehensive concurrent research revealed the immediate need for establishing a comprehensive data collection and analysis framework that captures detailed information on service delivery outcomes, particularly for vulnerable groups, to identify specific community needs and track service delivery effectiveness (Rijal et al., 2024). Further, this study also confirmed the significance of having in place an integrated information system that allows for real-time data sharing and collaboration between different government departments and agencies to improve coordination and data accuracy.

At Birendranagar Municipality, it was observed that the ICT infrastructure plays a crucial role in the process of data management and evidence-based policymaking. The local ICT office utilizes technology for efficient human resource management, including electronic attendance systems and use of CCTV cameras. A variety of software applications are employed for different functions, some developed by the federal government and others created locally (Rijal et al., 2024). These systems support social security, education management (EMIS), budgeting, and data collection for agricultural purposes. The data collection and budgeting processes are tailored to population and geographical factors, ensuring that policies are grounded in accurate and relevant data.

At Ward number 6 of Birendranagar Municipality, it was observed and vividly shared by different participants that the policy decisions are made through community engagement and discussions with key stakeholders. The Ward Committee, which includes representatives from the respective communities, is responsible for finalizing decisions after consulting with various groups within the community. A one-stop service approach is in place to streamline services, including exemptions in the collection of tax revenues, and waste management (Rijal et al., 2024). There are also plans to develop integrated software to manage commercial tax systems, which will incorporate property tax information, further enhancing data management and policy effectiveness.

Chaurjahari's approach to evidence-based policymaking involves extensive data collection through community discussions, executive meetings, and public hearings, which occur three times a year. This participatory approach ensures that diverse stakeholder inputs are considered in policy development. The local call center operates round-the-clock, throughout the weekdays, allowing residents to register complaints and provide feedback via an office automation system, grievance handling mechanism, and social media. Recently, formal operational guidelines and procedures were enacted to address grievances, with a committee reviewing and suggesting solutions every Friday. This system not only facilitates continuous public engagement but also helps in identifying and addressing issues promptly, thereby supporting data-driven policymaking (Rijal et al., 2024).

### **Proposed Vision and Strategic Framework on DMEP**

In the context of Karnali Province, the shared vision for data management should center around creating an integrated and transparent data ecosystem that empowers evidence-based policymaking. This vision should encompass the development of a robust data infrastructure that supports accurate data collection, real-time analysis, and informed decision-making. Fostering a culture of data-driven governance, we should ensure that policies are effectively tailored to the provincial unique socio-economic and geospatial

challenges. The vision also should emphasize the importance of collaboration between local, provincial, and federal entities to create a cohesive data management framework that aligns with national goals while addressing regional needs. The Karnali Province Government should act upon the institutionalization of such a vision as part of a responsive and futuristic policy intervention.

To address the challenges and leverage the opportunities in data management for evidence-based policymaking in Karnali Province, following the task of crafting a shared vision, the Provincial Government in Karnali should act upon enacting a comprehensive strategic framework in this respect. This framework should outline key actions and investments needed to build a robust data ecosystem, focusing on improving data infrastructure, ensuring quality and standardization, enhancing accessibility and sharing, and safeguarding privacy and security. By implementing these strategic components, Karnali can develop a cohesive and efficient data management system that supports informed decision-making and effective governance, ultimately contributing to the region's sustainable development and alignment with national objectives.

- a. **Strengthening Data Infrastructure:** Developing a robust data infrastructure should be emphasized as a prerequisite to effective data management for evidence-based planning interventions. This should involve upgrading data collection systems, investing in modern storage solutions, and ensuring the reliability and accuracy of data. In Karnali, this can be achieved through the establishment of provincial data management centers equipped with advanced technologies for data collection and analysis. These centers should be supported by reliable internet connectivity and digital tools to facilitate seamless data flow and integration (World Bank, 2021). The MU Policy Lab-based Karnali Data Bank can be adapted as a model for piloting such intervention.
- b. **Enhancing Data Quality and Standardization:** Standardizing data collection and reporting procedures across different government levels is crucial for ensuring data consistency and comparability. Implementing standardized protocols and training programs for data collection and analysis can help address discrepancies and improve data quality. This includes adopting international best practices and frameworks that are adaptable to the local context (OECD, 2019). Regular audits and assessments should be conducted to maintain high data quality standards.
- c. **Promoting Data Accessibility and Sharing:** Encouraging open data policies and enhancing data accessibility is key to fostering transparency and collaboration. Creating centralized data repositories that are accessible to various stakeholders, including government agencies, researchers, and the public, can facilitate better coordination and informed policymaking. Establishing data-sharing agreements and platforms that allow for real-time data exchange between local, provincial, and federal levels will support a more integrated approach to governance (United Nations, 2015).
- d. **Building Technical Capacity:** Investing in capacity building for data professionals is essential for effective data management. This includes training programs focused on data analysis, cybersecurity, and the use of advanced data management tools. In Karnali, capacity-building initiatives should target both government staff and local stakeholders to ensure that they possess the skills needed to manage and utilize data

effectively. Collaboration with academic institutions and international organizations can provide additional resources and expertise (World Bank, 2018).

- e. **Ensuring Data Privacy and Security:** Protecting sensitive information and maintaining data privacy are critical considerations in data management. Implementing robust data protection measures, including encryption and access controls, is necessary to safeguard data from unauthorized access and breaches. Developing clear data privacy policies and ensuring compliance with international standards, such as the General Data Protection Regulation (GDPR), can help build public trust and ensure the ethical use of data (European Commission, 2020).
- f. **Establishing Policy and Institutional Frameworks:** A comprehensive policy and institutional framework is vital for guiding data management practices. This includes developing a provincial data management strategy that outlines roles, responsibilities, and procedures for data governance. Engaging stakeholders in the development of these frameworks ensures that they are aligned with local needs and priorities. Regular reviews and updates of policies are necessary to adapt to evolving data management challenges and technological advancements (Federal Data Strategy, 2020).

### Ways Forward for Fostering Effective and Futuristic Policy Transformation

To advance data management and enhance evidence-based policymaking in Karnali Province, a forward-looking approach is crucial. This involves fostering multi-level collaboration, embracing technological advancements, promoting public engagement, and establishing robust monitoring and evaluation mechanisms. By pursuing these strategies, Karnali can overcome current challenges, capitalize on emerging opportunities, and build a resilient data management framework that supports effective governance and drives transformative policy changes. These efforts will help ensure that the data-driven policies developed are both innovative and responsive to the evolving needs of the region.

- a. **Fostering Multi-Level Collaboration:** Enhancing collaborations between local, provincial, and federal entities is crucial for effective data management. Organizing regular inter-governmental meetings and joint projects can help align data management practices and address common challenges. Establishing cross-level working groups focused on data governance can facilitate knowledge sharing and problem-solving (ONS, 2020).
- b. **Leveraging Technological Advancements:** Embracing emerging technologies, such as artificial intelligence and machine learning, can improve data analysis and predictive capabilities. Investing in technology infrastructure and exploring innovative solutions for data management will help Karnali stay ahead in the digital era and enhance its policymaking processes (World Bank, 2021).
- c. **Promoting Public Engagement:** Engaging the public in data-related initiatives can enhance transparency and accountability. Developing platforms for citizen feedback and participation in data collection efforts can provide valuable insights and foster a culture of open governance. Public awareness campaigns about the importance of data and its role in policymaking can also contribute to more effective data management (United Nations, 2015). Also, it is equally important to work proactively in the landscape of public grievances.

- d. **Monitoring and Evaluation:** Establishing mechanisms for monitoring and evaluating the effectiveness of data management practices is essential for continuous improvement. Regular assessments of data quality, accessibility, and policy implementation can help identify areas for improvement and ensure that the data management framework remains responsive to changing needs and challenges (OECD, 2019).

By adopting this shared vision and strategic framework, Karnali Province can build a robust data management system that supports evidence-based policymaking and drives development in the region. The integration of these strategies will help address existing challenges and leverage future opportunities to create a more effective and future-oriented policy transformation and implementation at different levels of the federal structural system of Nepal.

### Conclusions

In conclusion, the effective management of data is a cornerstone of successful federalism and evidence-based policymaking. For Karnali Province, the following key points emerge:

- a. **Data Management as a Pillar of Effective Federalism:** A well-structured and integrated data management system is critical for the efficient operation of federalism. It enables informed decision-making and policy formulation, essential for addressing the diverse needs of Karnali Province.
- b. **Critical Need for Infrastructure and Capacity Building:** There is an urgent need to address gaps in data infrastructure and technical skills. Investments in advanced technologies, standardized data protocols, and comprehensive training programs are essential to enhance data reliability and accessibility.
- c. **Emphasis on Data Quality and Standardization:** Ensuring data quality through standardized collection and reporting procedures is crucial. Adopting international best practices and conducting regular quality assessments will improve the credibility and effectiveness of data used in policymaking.
- d. **Importance of Data Privacy and Security:** Protecting data privacy and ensuring robust security measures are vital for maintaining public trust. Aligning with international standards, such as the Global Data Research Review (GDPR), will safeguard sensitive information and ensure ethical data handling.
- e. **Fostering Multi-Level Collaboration and Innovation:** Strengthening collaboration between local, provincial, and federal levels, alongside embracing technological innovations, will enhance data management systems. Engaging stakeholders and the public will further support evidence-based policymaking and promote sustainable development in Karnali Province.

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