Data for Development in Nepal

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Driving the data revolution

Nepal's evolving data community

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Contents

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The opinions expressed are those of the author and do not necessarily reflect the views or policies of the UK government or other partners of the D4D programme.

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The D4D Program aims to improve the sharing and use of data as evidence for development. Implemented by The Asia Foundation in partnership with Development Initiatives with funding from UK Aid, the D4D Program supports a range of local organisations to conduct innovative technical initiatives, research studies and engagement activities aimed at growing the demand for, supply of and use of data. Through this the D4D Program works to strengthen a functional, inclusive, and locally led data ecosystem in Nepal.

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Introduction

Nepal faces a range of social and economic challenges that, if addressed, could transform the lives of millions. To address these challenges, action is required by governments, civil society, private sector and donors. But the action – policies, programmes, services, etc – will be more likely to succeed if informed by robust data-driven evidence. The use of data-driven evidence to inform decision-making, monitor progress and evaluate development outcomes is essential for Nepal's development progress. Ensuring data is captured, shared and used effectively and responsibly is a key part of enabling significant and sustained progress for Nepal and its people.

Progress on the sharing and use of data-driven evidence has been made over recent years, with a growing number of organisations, initiatives and government champions striving to develop Nepal's 'data ecosystem' and advance the sharing and use of 'open data'. Non-governmental organisations have played a particularly significant role in this process, providing technical data solutions; advocating for appropriate data policy; empowering citizens to demand data transparency and accountability; and supporting the building of skills among data suppliers and users. Over the past few years this community of organisations – known as the 'open-data community' or 'data community' – has grown in number, maturity and ambition, and spurred important advancements in data sharing and use. However, Nepal's technical, political, economic and social context is rapidly evolving, which, together with the country's federal restructuring, presents a new series of challenges for these groups to address.

Development Initiatives and the Asia Foundation, with support from UK Aid, have been working in collaboration with a range of partners to support the strengthening of Nepal's data ecosystem and advance the sharing and use of open data. Our focus has been on catalysing, convening and supporting the work of the data community to drive progress. Building on Development Initiatives (DI)'s 2017 paper 'Nepal's emerging data revolution',[1] this report shares our observations of recent progress achieved by Nepal's data community and important lessons and approaches that can guide the community's future progress. We hope this will help inform the work of practitioners and donors in further strengthening Nepal's data ecosystem and support the development of similar approaches in other country contexts.

Open data in Nepal

Access to information, open data and the data revolution

'Open data' is data that anyone can access, use and share.[2] It can be data from any source, such as from government, business, academia and civil society, and on any topic, including data on people, the economy and the environment.[3] Open data is a foundation of data-driven evidence and a tool for improving access to information and facilitating the use of evidence in decision-making and accountability.

In line with what has been seen internationally,[4] over the past 10 years open data has become recognised in Nepal as a potential facilitator of improved governance, accountability, innovation, empowerment and economic growth. The growing focus globally on data as a key driver of sustainable development is known as 'the data revolution', a term coined in 2015 as part of the planning that defined the Sustainable Development Goals.[5] The data revolution refers to the transformational change required in data production, sharing and use to enable a better understanding of social and economic challenges, which will enable the design of better targeted, more effective policies, programmes and services. In 2015, the global data revolution discourse positioned open data as a gold standard for data sharing; however, over the past five years the discourse has evolved to focus less on the perceived promise of technically open data and more on the conditions necessary for data of all kinds to support positive change. Government, development partners, private sector, academia and civil society have a critical role to play in driving the data revolution.

The evolution of open data in Nepal

In Nepal, calls for improved access to information in the 1990s and early 2000s lay the early foundations for data access and sharing. In response to civil society and media campaigns, Nepal's Right to Information Act was enacted in 2007, which included requirements for both proactive information disclosure and reactive releases of specific information in response to citizen requests.[6] Although commentators critique the adequacy of the Act's implementation, it enshrines access to information as a fundamental citizen right.[7] This provided a footing for the technical-led approaches to improving access to information favoured in the 2010s.

Early progress made on the open data agenda, as documented in DI's 2017 paper on 'Nepal's emerging data revolution', included the set up in the 2010s of civic-tech-led data portals containing data scraped from government sources and early donor-led initiatives delivered in partnership with the government, most notably the Aid Management Platform. These efforts, as seen in other countries at the time, were driven by a belief that citizens, as taxpayers, have a right to access data gathered by the government and that government data should therefore be 'open by default.'[8] Much of the global progress at this time was led by civic tech actors, government champions and donors that believed that improving the availability of data would lead to its use in processes of decision-making and accountability.

In Nepal, these efforts were accompanied by the growth of a network of collaborators who shared a common enthusiasm for embracing open data as a tool to improve Nepal's development progress. These early pioneers formed the Open Nepal network, which consisted of technical group Young Innovations, human-rights group Freedom Forum, Nepal's largest civil society umbrella body the NGO Federation of Nepal, and international organisation Development Initiatives. At the time, much of the global enthusiasm for open data had been driven by theories of impact relevant to high-income countries, and there was limited understanding of how, or whether, open data could have relevance in a country with significant technical, social, political and

economic challenges. The group worked together to investigate the value of open data in Nepal and raise awareness of its potential among key government and civil society stakeholders. Rather than simply advocating for, creating and promoting open data, the group conducted investigations via open data pilots;[9] researching data needs, impact and policy;[10] and strategic awareness-raising events[11] to identify the conditions in which open data could have impact in Nepal.

Through their early activities this group identified that open data could be an influential tool to improve development progress across multiple sectors and stakeholder groups in Nepal, but certain conditions had to be in place. This included the need for proactive government leadership to enable sustainability of supply, backed by supportive legislation and policy; collaborative dialogue between data suppliers, intermediaries and users to identify and meet needs; improvements in data disaggregation, interoperability and quality to improve usability of data; and investment in building data literacy, technical capacities and data-use incentives to support use of data. The community recognised that for open data to have value the releases needed to be demand-led, but that there was a lack of demand for data in general and a lack of practice of evidence use in decision-making. While there was strong interest in the potential of open data, in Nepal's specific political economy a necessary first step was growing awareness of the value of evidence-use and building demand for improved access to information and data in general, rather than specifically for 'open' data. It was also recognised that for open data to have impact, the community needed to start with a better understanding of critical public problems, the decision-making processes related to these, the stakeholders involved, what their information practices were, and so on, and from there identify their data needs and how to meet them.

On the global stage, in recent years approaches to open data have matured in line with the early findings of the data community in Nepal. The global discourse on open data has become less optimistic and more nuanced, highlighting the issues around demand, appropriate use, governance and privacy. Global narratives now focus on opening data 'for a purpose' rather than 'by default' so that it helps solve important public problems. They stress the value of reusing and combining disaggregated datasets and are more cognizant of issues of data rights and privacy. They also recognise that success should be seen in terms of number of users of data, rather than numbers of datasets opened, and that data from private sources (such as businesses, academia and non-official data) is as valuable as data from government sources. Open data is rarely discussed now without diligent references to data responsibility, alternative models of data governance, and the potential for data to enhance economic growth as well as improve government performance and citizen engagement.[12]

Nepal's data community

The 'data community' comprises the advocates, innovators and enthusiasts who are progressing discourse and action on data for sustainable development.[13] DI's 2017 paper described Nepal's data community spanning civil society, private sector and government champions – as nascent and dynamic, but small in number and operating in a complex political, legal, economic, social and technical environment. The paper charted their successes in advancing Nepal's' data revolution and concluded that there was a critical role for Nepal's data community in driving progress towards better data use in decision-making and accountability.

Despite their progress, the organisations, initiatives and individuals that form Nepal's data community face a range of institutional barriers, such as limitations in number, capacity, alliances and networks, and in financial sustainability. To improve the sharing and use of data in Nepal, donor programmes have increasingly recognised the need to empower the data community and address these barriers. This includes the Data for

Development (D4D) in Nepal Program, set up in 2017 specifically for this purpose, as well as in some components of other donor programmes.[14]

Box 1: Data for Development (D4D) in Nepal Program

With support from UK Aid, the Asia Foundation and DI have run the Data for Development (D4D) in Nepal Program since 2017. This builds on DI's efforts since 2011 to catalyse a functional, inclusive and locally led data ecosystem and the Asia Foundation's work across Asia to promote the use of data as evidence for development by policymakers, civil society and the private sector.

The D4D Program focuses on strengthening the data community to build effective and proactive local leadership of the data for development agenda. Through capacity strengthening, technical support and funding, the D4D Program has supported a wide range of Nepali organisations to conduct innovative technical initiatives, research studies and engagement activities aimed at growing the demand for, supply of, and use of development data.

Working in partnership with the data community, D4D Phase 1 (2017 to 2020) grew demand for data by the government, civil society and the private sector, increased the availability of data, and improved capacity to use data for evidence-informed decisions. D4D Phase 2 (2020 to 2024) is focusing on strengthening data ecosystems at local, provincial and federal spheres.

Organisations the D4D Program has worked with as part of the data community:

Bikas Udhyami

Clean up Nepal

Digital Data System for Development

FACTS Nepal

Freedom Forum

Kathmandu Living Labs

Foundation for Development Management

LSP Associates

Naxa

National Business Initiative

National Federation of the Disabled – Nepal

NGO Federation of Nepal

Nepal Institute of Research and Communications

Niti Foundation

Open Knowledge Nepal

Rooster Logic

Robotics Association of Nepal

The Open Institute for Social Sciences

Women Leaders in Technology

Women in STEM

Young Innovations

Youth Innovation Lab

YUWA

Nepal's evolving context for data

In the short period since DI's 2017 paper 'Nepal's emerging data revolution' was published, a number of trends have impacted Nepal's data context, presenting a series of new challenges for the data community. The following section summarises some of the major trends.

Nepal has a range of new social and economic challenges, resulting in increased data needs

In recent months, the global Covid-19 pandemic has resulted in a wide range of urgent new data needs in Nepal. The response to the pandemic has required new questions to be addressed, new data to be collected and new concerns to be managed around data accuracy, comparability and protection. In addition, responding to the increasing threat of climate change, the growing focus on private sector development, and continued high levels of economic and social inequality have grown the need for data.

However, the key change impacting data needs has been Nepal's administrative evolution from a unitary state to a federal structure. Nepal's 2015 Constitution created seven provincial and 753 local governments. To enact the wide range of policies, budgets and plans required to execute their functions, provincial and local governments need more than capacities, institutions, systems, resources and staff; they also need sound evidence to ensure that their work meets the needs of the communities they represent. This has resulted in an increased and immediate need for good quality, accessible and disaggregated subnational data. In addition, for policies and budgets to be developed and decisions to be made, citizens, civil society, media and the private sector need access to data-driven evidence to allow them to meaningfully participate and hold their locally elected leaders to account. Nepal's new federal structure has grown the urgent need for strong subnational data ecosystems that support the local use of evidence for decision-making. There is an important role for the data community in responding to this need.

There remains a lack of trusted and relevant data available in usable formats to meet these needs

Although the existence of new, alternative and non-official sources of data are increasing, many of the limitations in official data availability, accessibility and usability detailed in DI's 2017 paper remain true in 2021. There is a lack of disaggregated data relevant to most of Nepal's administrative areas and its diverse population. National survey data cannot provide the level of disaggregation required to support local governments; it is not financially or operationally viable to administer surveys on that scale. While administrative data provides a potential solution to this, the systems to produce and use the data at that level are not currently in place.[15] Efforts to produce disaggregated data have been fragmented with limited coverage, and the lack of unique identifiers has prevented data interoperability between one scheme and the next. There is a lack of up-to-date data, concerns about data accuracy and, due to limited official mechanisms for public sharing of government data, limited access to official data. Where data can be accessed, it is often published in a manner that prevents re-use, for example in hard copy as tables or analysis in reports or embedded in websites as web text or in downloadable PDFs. Although the publication of open data has grown, data is still rarely shared in open and machine-readable formats, which hinders analysis and re-use.

Legislative restrictions to data sharing have grown

The complex legal and policy environment has been a long-term constraint to data sharing and use in Nepal; however, the recent tightening of legislation on privacy and further closure of civil society space[16] has potentially regressed the enabling environment for data sharing. There has been widespread criticism of Nepal's new IT Bill and Media Council Bill due to their curtailments to access to information, increased surveillance of personal data, limitations on storage of data, proposal of penal provisions for "breaking privacy", and provisions on intermediary liability that dilute the protection of social media and information platforms.[17] Nepal's proposed National Statistics Bill, awaiting discussion by parliament, has also led to concerns from groups that re-share and re-use government data.

The data community is, however, coming together in an attempt to address some of these legislative barriers. In addition to leading recent discussions on the National Statistics Bill, Freedom Forum in 2019 led a coordinated civil society effort to create a legal mandate for open data. They worked with the National Information Commission to propose an amendment to the Right to Information Act to the Ministry of Communications and Information Technology.[18] However, legislative change is slow, and progress on the amendment has stalled. There are other examples where early progress on creating formal legislative plans for opening data have stalled. The Open Government Data Action Plan, which was submitted to the Prime Minister's Office by the National Information Commission in 2017[19] has not yet been implemented, and the Government's Open Data Steering Committee is no longer active. Despite further advocacy by the Open Government Partnership, Nepal has still not become a member.[20] The formal adoption by the Central Bureau of Statistics (CBS) in 2019 of a new National Strategy for the Development of Statistics (NSDS) could have been a significant step towards addressing legislative barriers for data sharing and data use. Promisingly, the NSDS included a provision on open data; however, the approved final version of the NSDS was markedly less ambitious than earlier drafts, and evidence of an implementation plan is yet to emerge.

Capacity remains a key barrier to data use

Limited research exists into the levels and nature of data literacy in Nepal, but it is widely understood that the capabilities to work with data and draw meaningful insights are generally low, particularly outside of Kathmandu. This is a critical barrier to data use, even where people have access to data. Despite the growing need for data, there are low levels of articulated demand for data from civil society and the private sector, and this has constrained incentives for the government and others to share their data.

Over the past few years there has been a growing focus by the data community on strengthening capacities of key stakeholder groups to work with data. These have progressed from disparate training sessions to strategic attempts to build sustained capacities. This has included, for example, the use of public problem solving through applied use of data;[21] the development of university curriculums to include data analysis;[22] ongoing mentoring of journalists;[23] the use of 'training of trainers' approaches;[24] and the adoption of longer term partnerships that transfer a holistic range of data capacities through close collaboration in the implementation of activities.[25] There has also been increasing efforts by the data community to go beyond building data literacy to addressing cultural and political barriers to data use. This has included the use of round table discussions and media activities to challenge business decision-making norms;[26] policy dialogue to stimulate discussion among local governments on data use;[27] multi-day workshops with the government to facilitate open procurement action planning;[28] and public events to challenge cultural assumptions and perceptions on the value of data.[29]

The growing digital divide threatens equality of access to information

Asymmetries in access to data are a prevalent feature of Nepal's data landscape, but for many the opening of data has not addressed these. Inequalities in access to technical infrastructure, such as internet, electricity and computer hardware and software, result in social divisions in access to information and open data. While the growing digitisation of government systems and services will lead to improvements in equality of access to information for some,[30] it will likely exacerbate the 'digital divide' between those communities that have access to digital systems and those that do not. The growing levels of internet penetration, stabilisation of the electricity supply and reducing costs of technology will, over time, reduce this divide, as will government schemes such as the setting up of IT service centres in 124 remote villages in a bid to provide integrated government services and combat digital exclusion.[31] However, in the meantime the offline sharing of information remains necessary.

It is also essential for data sharing initiatives to develop outside of the more connected Kathmandu valley. Prior to 2017 the vast majority of known data initiatives were based in Kathmandu, but since the new federal structure was established, an increasing number of data-sharing initiatives have focused on local governments, albeit still implemented primarily by Kathmandu-based firms.[32] Improving the use of data and information at subnational levels will be an important focus for Nepal's data community going forwards, as will be sharing their skills with local stakeholders who have the necessary contextual knowledge on local development challenges and decision-making processes for data to have impact.

The culture of data use is evolving

As data use is still a relatively new practice, Nepal lacks deep-rooted customs, norms and behaviours around the use of evidence in decision-making. Using data is not a standard process for many stakeholders, and the incentives, systems and policies to encourage data use are often not in place. The enabling environment for data use is slowly evolving, however generally it remains difficult to observe a direct correlation between the data produced and the use of that data in decision-making and accountability. There is limited evidence of data being used in the design of policies, programmes, services, advocacy and investment decisions.[33] There are, however, indications that demonstrate a positive trend in data use and a culture of data use is growing. This includes instances of local governments using data in the development of policy documents, annual budgets and plans,[34] of data gathered by civil society triggering a response by local governments,[35] of data being used in media and for advocacy campaigns, and of data being used by the private sector to support their business.[36] There has also been a significant increase in media attention on the importance of data and open data,[37] and a growing number of public events about the role of data.[38] With the increased production of official datasets disaggregated by province and data produced by municipalities and non-government entities, the culture of data use is expected to further evolve, and data use is expected to increase over the coming years.

Important progress in data

Despite the contextual complexities, there has been important progress in recent years in the sharing and use of data.

Data sharing has increased, albeit from a low base

Government-led rhetoric on data and open data has continued to grow, with the National Information Commission, National Planning Commission and CBS speaking publicly about its importance.[39] While the pace of government advancements in data sharing remains slow, there are promising indications of progress, several of which the data community have supported. The government is increasingly sharing information on public platforms, although in most cases this has not been in open data formats. For example, in 2019 the Ministry of Home Affairs invested in the development of a public disaster information dashboard, the BIPAD portal, which shares data from a range of government and non-official sources. The same year saw the launch of the National Data Profile by the CBS, which shares data and information on demographics, environment and the economy from the 2011 Census and the National Accounts System. In addition, the National Planning Commission hosts provincial Sustainable Development Goal data on their website, and Nepal Rastra Bank has shared data on financial inclusion via their Financial Inclusion Dashboard. These constitute substantial government-led steps towards sharing government data in Nepal. The rare instances of open data being published by the government have often been led by efforts from the data community. For example, with support of Kathmandu Living Labs the National Planning Commission and CBS published data from the National Housing Reconstruction Survey via the Earthquake Open Data Portal. This is one of the largest post-disaster datasets ever collected, containing data from almost 750,000 households on earthquake impacts, household conditions and demographic statistics, and is the first large-scale survey to be released as open data in Nepal.

Data sharing outside of the government has also grown. Over the past few years, building on the success of Young Innovations' Open Nepal portal, Nepal's growing data community have been prolific in setting up data portals and publishing open datasets. New multi-topic data portals include Open Data Nepal by Open Knowledge Nepal, Nepal in Data by Bikas Udhyami and NepStat by the Institute for Integrated Development Studies. Sector-specific data portals include the Nepal Disability Portal by the National Federation of Disabled, which shares six disability-related datasets, Demographic Dynamics of Nepal Portal by Digital Data System for Development, which shares data on health, births, deaths and migration, and the Nepal Waste Map, which generates and shares data on solid waste management. In many of these instances the data community has found ways to add value to government information releases through scraping, cleaning and coding datasets, such as Open Knowledge Nepal's sharing of historic records of real-time data on air quality, vegetable pricing and river levels. Increased efforts are required to ensure that these initiatives are sustained over the long term and, where feasible, scaled up, as several have been characterised by short timeframes resulting from donor funding cycles.

Demand for data among governments, civil society and the private sector has increased, although not specifically for open data

While data needs are growing, this has not necessarily translated into data demand. Evidence-based, participatory decision-making processes are not yet a widespread norm across Nepal's provincial and local

governments. As such, decision-makers and the communities that hold them accountable do not always see a role for data or express a demand for it. They are often not aware of the value that data holds for them and do not articulate their needs to data producers, who may themselves be unaware of the value that their data has for others.

Low demand for data has been regularly cited in Nepal as a barrier to data supply and use. The Foundation for Development Management's 2018 study on local open data identified that awareness on the importance of data was still relatively low, and that the lack of data demand by civil society is a major barrier to information sharing by governments.[40] FACTS Research & Analytics' study on open data for business revealed that open data is not a widely known concept to Nepali businesses, and that significant distrust of government data limits levels of demand.[41] DI's 2018 study 'Aid data needs and use cases in Nepal' highlighted the preference for analytical information over raw data and the continued practice of relying on information from narrative reports, websites and interpersonal networks even when data was available.[42]

Catalysing demand is challenging but needs to start from the problems that people are trying to solve and raise awareness of data as a tool for informing the actions to address them. The data community has an important role to play in navigating Nepal's specific technical, social, political and economic context to link those that have a need with data supply. They also have a role in advocating demand on behalf of stakeholder groups that are less familiar with data's potential. Over the past few years, a range of data-community-led efforts have taken place to grow understanding of the value of data and hence build demand for data by key development stakeholders for use in decision-making and accountability. While this has contributed to growing interest in data, Nepal's federalisation process has been the primary stimulus for increased demand for accurate, relevant, accessible and usable data. The demand is not specifically for open data, which is still a new concept for most, but for disaggregated information to support Nepal's new provincial and local governments to execute their functions. There are also growing calls for data by some civil society organisations, the media and the private sector, who want to participate in policymaking and planning processes and hold their locally elected leaders to account for their performance. However, in general, awareness on the importance of evidence-informed decision-making is still relatively low.

Despite this, there has been increased engagement by the data community and parts of the government in global discourse towards improved data. For example, at the 2018 International Aid Transparency Initiative conference, Nepal's Minister of Finance reconfirmed Nepal's commitment to improving the sharing of open data on aid spending, at the 2018 World Data Forum a delegation from CBS took part in panel discussions, and at the 2019 International Open Data Conference a delegation from the CBS and the National Planning Commission presented Nepal's open data progress. In contrast, the level of interest from Nepali data stakeholders in performance on comparative global indices has been low. Nepali stakeholders are rarely consulted in the assessments of progress and the scores and ranks assigned often fail to reflect the progress being achieved. These indices have registered moderate progress in Nepal's performance, for example over the past five years Nepal's openness scores on the Open Data Inventory have ranged from 17 out of 100 in 2015 to 38 in 2020.[43] There has, however, been an increase in interest from groups outside Nepal in the work being undertaken by the data community. For example, the 2019 State of Open Data Histories and Horizons report by the Open Data for Development Network included several references to Nepal's data organisations, and the use of data by local humanitarians following the 2015 earthquakes continues to be a widely cited case study when demonstrating the value of open data.[44]

Nepal's open data movement has grown and become an important facilitator of progress

In the short period since DI's 2017 paper, a number of important trends have been observed in the development of Nepal's data community and their advancement of Nepal's data revolution. Nepal's data community has grown in number and reach and demonstrated increasing leadership for the agenda to improve data production, sharing and use. The community has expanded beyond technical and legal specialists to include civil society groups, small businesses and local government champions. There has been a growing number of Nepali organisations proactively conceptualising innovative initiatives to improve data sharing and use[45] and the early pioneers of Young Innovations, Kathmandu Living Labs and Freedom Forum have been joined by new organisations that have made progress in data a key focus of their mandates, including groups such as Bikas Udhyama, Naxa, Open Knowledge Nepal and Youth Innovation Lab. Data initiatives relevant to specific sectors of focus have also started to be developed by established sectoral groups, such as the National Federation of the Disabled, Clean Up Nepal and YUWA, which has increasingly linked data releases with sectoral needs.

Efforts by the data community to improve the accessibility of data are maturing. In many early cases the data initiatives were driven by a desire to share data without a clear understanding of who would use this data, for what purpose, and therefore in what way this would need to be shared. Building on lessons from early data-sharing efforts, more recent initiatives by the data community have been designed to support the use of data, following the global trend towards 'publish with purpose' rather than 'opening by default'.[46] The needs of information users are increasingly being considered and built into the design of data-sharing interventions, apps and websites. Partners supported by the D4D Program received training in user research and needs and designing for impact, and all data-sharing initiatives supported by the programme conducted user research, adopted 'user experience' design practices, and developed strategies to ensure user adoption.[47]

Despite this, the sustainability of data interventions has remained a challenge. Several of the interventions highlighted in DI's 2017 paper have not been sustained. The reasons for this are varied but can generally be attributed to a lack of ownership by the government, the fast paced nature of staff and political turnover (e.g. the Ministry of Health's short-lived Smart Health Initiative) and concerns around the lack of a legal basis for data sharing (e.g. as experienced by Opening Contracting Partnership's Public Procurement Information Portal). The short cycles of donor funding and lack of financial self-sufficiency have also had a significant impact (e.g. constraining further development of the Nepal Open Taxation Data portal and the Nepal Disability Data portal). There are instances where these hurdles are being overcome through long-term strategic engagement to ensure genuine government ownership, for example the BIPAD portal is now overseen by a series of government committees and co-financed by the Ministry of Home Affairs, and the Ministry of Finance's Aid Management Platform has been redeveloped by a Nepali firm to reduce the need for external resources. A key learning for the data community is the need to proactively identify, agree and financially plan for pathways to national ownership from the start of any data initiative.

The data community has been diverse in their efforts to bring about change, demonstrating an understanding that open data in itself does not solve problems. Their efforts have progressed beyond opening up data to addressing issues of legislation, building demand and awareness and encouraging sustainable data literacy. New topics have been addressed such as the potential for artificial intelligence, machine learning and big data to address social and economic challenges.[48] Some trends being seen in the global open data discourse have been less prevalent in Nepal, such as narratives on data rights and privacy, and on new models of data governance.[49]

Timeline of open data milestones in Nepal

2013

- Open Nepal launched as a collaborative civil society initiative to promote greater access to and use of data.
- The government starts publishing aid data via the Aid Management Platform.
- Civil society celebrates International Open Data Day for the first time.
- Nepal's first open data portal is launched by Open Nepal and Young Innovations.
- Nepal is included in the Open Data Index, scoring 30%.
- Mapping data on education and health institutions is widely collected for first time, by Kathmandu Living Labs as part of World Bank Open Cities project.
- Election data on candidates and results is opened for first time, by actors including Young Innovations and Open Knowledge Nepal.
- Nepal is included in the Open Data Barometer, scoring 15.7/100.

2014

- Open Nepal conducts its first training sessions with civil society and journalists on open data.
- The first research on the emerging impacts of open data in Nepal is published by the Web Foundation, Freedom Forum and DI.
- DI holds the first high-level multi-stakeholder discussion on the data revolution.
- The World Bank conducts its first open contracting pilot in Nepal.
- The Office of the Prime Minister publishes its first detailed government expenditure on items over NPR 5,000 (approximately US$40).

2015

- The government's National Planning Commission releases its first interactive visualisation of development indicators, supported by Kathmandu Living Labs.
- The government uses its first mobile app to collect citizen feedback data: the Hamro Police App by Nepal Police and Local Interventions Group.
- Nepal's first subnational open data portal is launched: Transparency and Participation Forum, supported by Young Innovations and Kathmandu Living Labs.
- There is the first widespread use of crowd-sourced, citizen-generated and mapping data in Nepal as part of an earthquake response, including QuakeMap, Earthquake Transparency Portal, Quake Helpdesk, and Population tracking using Ncell data by Flowminder.
- The government uses large-scale mobile technology for survey data collection for the first time, collecting data on earthquake damage.
- Government representatives attend the Open Government Partnership Summit in Mexico.
- A series of sensitisation workshops on open data are held with the government for the first time, hosted by United Nations Department of Economic and Social Affairs with support from local data actors.
- Open data is assessed at the subnational level for first time, using the local Open Data Index by Open Knowledge Nepal.

- The government's National Planning Commission publishes a report on monitoring the Sustainable Development Goals and recognising data gaps.

2016

- The governmental Office of Company Registrar publishes data on companies for the first time.
- The first public government panel debate on open data is held at Open Data Day 2016.
- Nepal's first public procurement transparency initiative commences, led by the Public Procurement Monitoring Office, Open Contracting Partnership and Young Innovations.
- The first Open Data Steering Committee is formed, headed by National Planning Commission, to devise a national open government data action plan for Nepal.
- New civil society initiatives sharing open data appear: NepalMap by Code for Nepal, Nepal In Data by Bikas Udhyami, and open mapping by db2map.

2017

- The government makes the first sector performance tracking system public: Ministry of Health's Smart Health Initiative.
- The first research documenting the progress of Nepal's data community is published, by Development Initiatives.
- Nepal's' first open data innovation fund is launched by the D4D Program.
- The first activities take place in Nepal to engage the private sector with open data, hosted by the D4D Program and Kathmandu Living Labs.
- The first activities take place in Nepal to engage youth with open data and data leadership, hosted by Open Knowledge Nepal and YUWA.

2018

- Official survey data is published in open format for the first time, by the National Planning Commission and Kathmandu Living Labs, from the earthquake housing and reconstruction survey.
- Civil society-led, topic-specific open data portals are published for the first time, including the Nepal Open Taxation portal by LSP Associates, Nepal Mausam Open Weather data portal by Rooster Logic, Demographic Dynamics data portal by Digital Data System for Development, Disability data portal by National Federation of the Disabled Nepal and the Open Hydropower Portal by Niti Foundation and Naxa.
- The first high-level workshop discussing the role of open data and right to information in Nepal's new federal structure takes place, hosted by Freedom Forum.
- The first high-level discussions on the opening up of private sector data take place, hosted by the National Business Initiative.
- Research on open data needs in Nepal is published for the first time, including on aid data needs by Development Initiatives and private sector data needs by FACTS Nepal.
- Nepal's largest open data day celebration (to date) takes place, attracting over 1000 visitors, by Open Nepal, Accountability Lab, Bikas Udhyami, Centre for Data Journalism, Freedom Forum, Kathmandu Living Labs, Local Interventions Group, Open Knowledge Nepal, Asia Foundation and Development Initiatives.
- Nepal's first public exhibitions of open data infographics take place in Kathmandu at Patan Durbar Square, hosted by D4D Program.
- Nepal's first qualified open data trainers complete their training from the Open Data Institute.

2019

- Nepal's first Women in Data conference is held with over 400 attendees, hosted by D4D Program and partners.
- With 26 events, Nepal has largest number of open data day events in the world.
- The first open data fellowship programme for women is held, hosted by 10 organisations and led by Open Knowledge Nepal.
- The first disaster information management system, BIPAD, containing open data is launched by National Emergency Operation Center and Youth Innovation Lab.
- The first real-time open data on air quality, hydrology and vegetable pricing is shared in Nepal, along with historical records, by Open Knowledge Nepal.
- The prime minister of Nepal inaugurated the integrated National Data Portal, which collates data from all three levels of government.

2020

- Nepal's first initiative for promoting women entrepreneurship is launched by Women in STEM Nepal, Women Leaders in Technology and Open Knowledge Nepal.
- Nepal's first open budget portal is launched by Alankar technologies, which contains province level budget allocation and spending data published by provincial government.
- 'Hawa ko Reporter', Nepal's first AI-enabled messaging tool, which engages people on the emergence of air pollution and is based on real time data provided by the government, is launched by Naxa.
- Nepal's first innovation mapping portal is launched by Nepal Academy of Science and Technology to identify, map and disseminate information regarding innovators and their innovation in Nepal and beyond. The portal started with the idea of mapping innovations that concern with Covid-19.
- SUSASAN COVID-19 Transparency Portal for Local Governments is launched, which provides information for those affected by Covid-19 as well as a dashboard of survey findings.

Future directions of Nepal's data revolution

To further strengthen the data ecosystem in Nepal so that it can meet the demands of the new federal structure and support a growing culture of data use, it is critical that the above advancements are built upon and sustained, and particularly that subnational data ecosystems are invested in. The Government of Nepal, private sector and civil society have an integral role to play in this, as do development partners. The existence since 2018 of the Development Partners Statistical Coordination Group[50] demonstrates the growth in interest from donors in funding activities aimed at supporting data production, sharing and use, and the recognition of the need for increased collaboration among agencies to ensure coordination of their funding. Importantly, the capacities of local organisations to drive the data agenda need to be strengthened, and donor programmes need to respond to this need. This approach has been successfully adopted by initiatives such as the D4D and

Susasan programmes, which have recognised the critical role that the data community can play in facilitating genuine ownership, leadership and sustainability of data initiatives by government bodies.

To further its reach, the data community needs to grow in number with synergies built between their efforts. While supporting pioneers and champions are a start, efforts to strengthen the data ecosystem need to focus on building a holistic, interactive system of data publishers, technical intermediaries, data advocates and data users to avoid creating power imbalances and concentrating opportunities among the few. It is critical for the data community to ensure it remains connected to grassroots communities so that it can represent their needs and avoid data becoming an agenda that is captured by elites without public backing.

As the data community evolves its efforts to build demand for data, improve data sharing and strengthen capacities to use data, important new areas for them to address include:

- Supporting the availability of disaggregated data and analysis (potentially via a focus on administrative data) and improving interoperability of data systems and standardisation. This will enable the use of subnational evidence by improving the coordination among federal, provincial and local governments and non-government actors in data and statistics production.[51]

- Bringing transparency to government decision-making processes and enabling participation through engaging communities and supporting their use of data. Including marginalised groups, including those who are impacted by the digital divide, will be an important part of this.

- Strengthening policy and governance frameworks to challenge the regulatory uncertainty that is preventing data sharing and re-use. Alongside this, supporting the development of sustainable institutional structures to enable the re-use of data, such as data stewards[52] and cross-agency open data initiatives.

- Encouraging data responsibility by designing processes of consideration into all data initiatives and development of technologies (e.g., security, access control and privacy-preserving technologies) that can support it. In addition to preserving data rights and personal privacy, this should include management of risks from bias in the analysis and use of data.

- Deepen the focus on the sharing and use of private sector data. Data from government, academia and civil society will not be enough to fill all data gaps, and businesses stand to gain dramatically from the improved use of their own data. New operational and governance models can be developed to support the harnessing of value from private sector data.

There is an important role for donor programmes and collaborative networks to empower, coordinate, facilitate and build the data community's capacity, sustainability and impact. To be eligible for donor funding, partnerships with governments and collaborations with others, the data community often requires organisational strengthening. Constant reflection and learning is required as this is a fast-paced area of change, which needs to be facilitated and encouraged. To ensure that international lessons and experiences are built on, the community needs further exposure to global networks and discourse. Politically informed, flexible and adaptive approaches will also need to be supported to harness the evolving levers of change as Nepal's federal structure matures. A huge amount of progress on data sharing and use has taken place in Nepal over the past decade, and with the right support the data community will be well positioned to lead the next decade of progress.

Notes

1 Development Initiatives, 2017. Nepal's emerging data revolution. Available at: http://devinit.org/wp-content/uploads/2017/04/Nepals-emerging-data-revolution.pdf

2 This is the definition coined by the UK's Open Data Institute. Another commonly used definition is from the Open Knowledge Foundation, which defines open data as "data that can be freely used, re-used and redistributed by anyone – subject only, at most, to the requirement to attribute and share alike". Data is considered 'open' when it is shared in non-proprietary machine-readable formats (such as CSV), licensed for use (e.g. with a creative commons license) and available to all. Typically open data is 'raw data', i.e. highly disaggregated, non-analysed datasets with detailed metadata.

3 Open data does not involve the sharing of personal or private data.

4 The 2019 State of Open Data Report by the Open Data for Development Network highlighted a decade of global interest in open data as a transformative tool of more open, collaborative, innovative and participatory governance.

5 A term coined by the UN's Independent Expert Advisory Group on Sustainable Development in 2015, the data revolution is defined as the transformative actions needed to respond to the demands of a complex development agenda, involving improvements in how data is produced and used; closing data gaps to prevent discrimination; building capacity and data literacy; modernising systems of data collection; and liberating data to promote transparency and accountability.

6 The evolution of Nepal's RTI movement and policy can be read at: http://www.cmr.org.np/esp_rti_policy_brief.pdf

7 Groups such as Freedom Forum and the Citizens Campaign for Right to Information are supporting the implementation of RTI. Article 19's Country Report contains information about the Act's provisions and implementation.

8 Open by Default is the principle in which the government making its data accessible to the public is the expected norm, unless there is a sufficient justification that disclosing the data is not in the public interest.

9 For example, open data portals developed by Young Innovations, such as the Open Nepal data portal, the Ward 7 transparency and participation forum, the Citizen's Election data portal.

10 For example, research by Freedom Forum on the emerging impacts of open aid data in Nepal, and the links between RTI and open data.

11 For example, events to mark Open Data Day, government panel discussions, collaborative events with the National Information Commission to engage civil society, and events about the Open Government Partnership.

12 The numerous insightful publications documenting the global evolution of open data include The Third Wave of Open Data, State of Open Data and Dalberg's Open Data Retrospective.

13 The term 'data community' is generally used to describe all the data producers, intermediaries and users within a national statistical system, including government, private sector and civil society. In Nepal, due to government conservatism towards leadership on data sharing, the active 'data community' has predominantly been formed of non-government actors, many of which support the government with data initiatives both formally and informally. Therefore, in this paper the term 'data community' refers primarily to the community of non-government actors working on data progress.

14 This includes, for example, the World Bank's work on building data literacy in Nepal, which took a 'training of trainers' approach, and elements of the Sustainable use of Technology for Public Sector Accountability in Nepal programme, which empowered local data civil society organisations to work with data and tech.

15 Development Initiatives, 2020. Data Landscape of Nepal – Diagnostic and Action Plan (unpublished).

16 Civicus Monitor, 2020. Activists concerned about plans for new NGO law and other restrictive legislation. Available at: https://monitor.civicus.org/updates/2020/03/23/activists-concerned-about-plans-new-ngo-law-and-other-restrictive-legislation-nepal/

17 Concerns were raised by civil society and journalists, e.g. in the following articles: Why IT Bill is flawed, Asia Internet Coalition Criticises Nepal's IT Bill As "Vague And Unspecific" and Proposed laws in Nepal would stifle press freedom.

18 More information can be found at Freedom Forum, 2019. FF submits RTI draft amendment for legislating Open Data provisions Available at: http://freedomforum.org.np/ff-submits-rti-draft-amendment-for-legislating-open-data-provisionshttp://freedomforum.org.np/ff-submits-rti-draft-amendment-for-legislating-open-data-provisions

19 More information can be found at Data for development in Nepal. Open Government Data: A First Step Towards Evidence Based Decision Making. Available at: http://www.d4dnepal.org/2018/10/12/open-government-data-a-first-step-towards-evidence-based-decision-making/

20 In 2018, at the request of the US Embassy, a representative from the Open Government Partnership visited Nepal for high level discussions about Nepal's potential membership. Traction on this, however, was not sustained, and the May 2019 Open Government Partnership Summit in Canada had no formal representation from the Government of Nepal.

21 For example by Open Knowledge Nepal in their datathons and YUWA in their Pahichan scheme.

22 For example by the Open Institute in their plans to institutionalise SPSS training in Nepal's colleges.

23 For example by Bikas Udhyami and the Centre for Data Journalism.

24 For example by the World Bank in their data literacy training programme.

25 For example by the D4D Program in their Data for Development Innovation Fund.

26 For example, by the National Business Initiative in their open data for business roundtables, and FACTs Nepal in their private sector data research dissemination.

27 For example by Foundation for Development Management in their work on subnational open data needs

28 For example by Young Innovations and Open Contracting Partnership.

29 For example, open data day events in 2013, 2014, 2015, 2016, 2017, 2018 and 2019.

30 Ministry of Communications and Information Technology, 2018. Digital Nepal Framework: Unlocking Nepal's Growth Potential. Available at: https://mocit.gov.np/application/resources/admin/uploads/source/EConsultation/Final%20Book.pdf

31 Rigal P., 2019. Telecom Authority to set up IT Centres in 124 remote villages, Kathmandu Post, 9th June 2019. Available at: https://kathmandupost.com/money/2019/06/02/telecom-authority-to-set-up-it-centres-in-124-remote-villages

32 The Susasan Programme, for example, has supported the development of data portals in 12 municipalities.

33 There are some documented examples (e.g. Dennison L. The use of data by government actors in Nepal to solve development problems. Development Initiatives, [web blog], 20 December 2016, https://devinit.org/blog/the-use-of-data-by-government-actors-in-nepal-to-solve-development-problems) but there is scope to update and grow the evidence base on this.

34 For example, Damak municipality reportedly used the data collected for their municipal profile to calculate local taxes.

35 For example, in response to data gathered by Clean Up in their Nepal's Waste Map project, Kathmandu Metropolitan City made improvements in waste collection routes.

36 For example, Tootle is using data for the real-time pricing of rides, and Big Mart is using sales data to support stock selection.

37 Concepts of open data are now regularly articulated in the mainstream media (e.g. Solution to pollution). In 2019 leading business magazine Business 360 published its first article on open data (Open Data & Private Business) and there was a tv show on open data for business hosted by one of the leading TV journalists.

38 There have been a range of large-scale public events focused on data, including the 2018 Open Data Day event, which attracted over 2000 attendees, the 2019 Women in Data Conference, the 2020 Open Data Expo. In 2019, with 26 events, Nepal had the largest number of open data events in the world.

39 However, language used by the government to describe open data is often conceptually conflated with closed and big data and with issues of data privacy and data breaches.

40 Foundation for Development Management,2019. Research and engagement with open data scenario in 11 municipalities in Nepal (unpublished).

41 FACTS Nepal, 2019. The demand, use and sharing of open data by the private business sector in Nepal. Available at: http://www.d4dnepal.org/wp-content/uploads/2019/06/Full-Report_the-Demand-Use-and-Sharing-of-Open-Data-by-the-Private-Business-Sector-in-Nepal_FACTS-D4D.pdf

42 Zellmann C. and Pradhan, K.,2018. Aid data needs and use cases in Nepal, [web blog], Development Initiatives, https://devinit.org/resources/aid-data-needs-use-cases-nepal

43 Open Data Watch, 2020. Open Data Inventory. Available at: https://opendatawatch.com/publications/open-data-inventory

44 Some examples of this are Open Data for Developing Economies Case Studies, 2017. Nepal: Open Data to Improve Disaster Relief. Available at: https://odimpact.org/files/case-nepal.pdf; Opensource.com, 2016. Open source and open data's role in Nepal earthquake relief. Available at: https://opensource.com/life/16/6/open-source-open-data-nepal-earthquake; and Open Data for Development Network. State of Open Data. Available at: https://stateofopendata.od4d.net/chapters/regions/seasia.html

45 The D4D Program alone supported over 20 partners in their data initiatives.

46 This, for example, has been documented by the global Open Data Charter in their 2018 Strategy.

47 For example, in the development of the BIPAD portal, Youth Innovation Lab developed user personas and a user manual; in the development of their Nepal Waste Map, Clean Up Nepal consulted widely to understand what data had most value to users and the features of the portal to facilitate use for planning; and in the development of the Nepal Earthquake Open Data Portal Kathmandu Living Labs conducted a user feedback survey and gathered information on site visitors to enhance the user experience.

48 This includes groups such as the Robotics Association of Nepal and Artificial Intelligence for Development.

49 Alternative models of data sharing, such as data collaboratives with the private sector, are not yet being seen in Nepal.

50 The Development Partners Statistics Coordination Group brings together development partners with an interest in supporting the CBS and the wider national statistical system to ensure activities are as coherent and coordinated as possible.

[51] Development Initiatives, 2020. Data Landscape of Nepal – Diagnostic and Action Plan (unpublished).

[52] As described in: Gov Lab, 2020. Wanted: Data Stewards. Available at: https://www.thegovlab.org/static/files/publications/wanted-data-stewards.pdf