

Policy Brief

National Agricultural Data Infrastructure: Bangladesh

Summary

Bangladesh's economy is heavily dependent on agriculture. According to the Bangladesh Bureau of Statistics, agriculture, forestry and fishing contributed 11.2 per cent of the country's gross domestic product in 2022/23. The sector is characterised by subsistence production systems, largely dominated by small and marginal farmers. Bangladesh is also heavily affected by the impacts of climate change and the increased frequency of extreme weather events around the world. Changing rainfall patterns, irregular monsoons, cyclones, extreme heat, drought and flooding are all impacting production and trade decision-making.

Meanwhile, Bangladesh is championing the digital transformation agenda, through its Aspire to Innovate (a2i) programme. The country's Smart Bangladesh Vision 2041 has four pillars: Smart Citizens, Smart Government, Smart Economy and Smart Society. Smart Bangladesh is building on Digital Bangladesh to bridge the digital divide by innovating and scaling sustainable digital solutions for all citizens. A core part of the vision is Smart Agriculture, which aims to leverage cutting-edge technologies and data to address access to finance; weather, soil and input information; market intelligence; and overall capacity for data-driven Smart Agriculture.

Data could be the conduit for boosting intra-Commonwealth trade and investment, as enshrined in the Declaration on the Commonwealth Connectivity Agenda for Trade and Investment.¹ According to the Open Data Institute, the sharing of data can create social and economic value for people, organisations and the wider economy.² In ensuring data sovereignty, including by maintaining a secure, trusted data environment, governments have an important role to play in laying the foundations for a flourishing data-driven economy. This will involve pursuing policies that improve the flow of data and ensuring that companies that want to innovate have appropriate access to high-quality and well-maintained data.³

In May 2024, the Commonwealth Secretariat in collaboration with a2i and other partners convened a multi-stakeholder national dialogue in Dhaka that made recommendations on how to put in place an enabling environment for collaborative interventions among institutions engaged in agricultural data management, so they can design, establish and start to implement a National Agricultural Data Infrastructure (NAGDI) in Bangladesh.

The Commonwealth advocacy on NAgDI: Countries with robust public infrastructure are better equipped to meet the needs of their people and accelerate action towards the United Nations Sustainable Development Goals (SDGs). From the Commonwealth's perspective, NAgDI across the countries creates a broad interoperable data system that can act as a backbone to inform advisory decisions, policy decisions, and trade and investment decisions between countries.

What is the issue?

The Government of Bangladesh has made significant strides in laying a strong foundation for digital public infrastructure (DPI), with the goal of improving service delivery and increasing citizen participation in the governance process. Key among its advances are the national ID

database that contains biometric information for citizens; digital payment infrastructure to reduce the use of cash and increase financial inclusion; citizen service centres that provide a range of e-government services to citizens; and other online platforms to provide citizens with access to such services.



This experience will give Bangladesh a higher chance of success in designing and establishing the NAgDI, which is a model of DPI for agricultural data management at country level. Bangladesh is also endowed with a set of well-established institutions that have the capacity to handle data management processes in their respective areas. Other fundamental building blocks on which the country can rely to establish a robust NAgDI are the existing farm registries; mapped farmlands across the country; digital platforms serving the farming community; insurance platforms;

and platforms serving the government planning sector. Among the latter, the recently launched Food Systems Dashboard and the prototyping of agricultural data standards are encouraging signs for consolidation of the NAgDI.

However, there was general agreement among stakeholder institutions that duplication of efforts exist, and that a regulatory framework for agricultural data management in the country is needed. This may also require an entity that can gather stakeholders to discuss the issue and find solutions collaboratively. This was one of the

conclusions of the multi-stakeholder dialogue, convened by the Commonwealth Secretariat and hosted by the Government of Bangladesh, in collaboration with a2i and with financial support from the Open Society Foundations, held on 14–16 May 2024. Nevertheless, the dialogue on the establishment of a NAgDI also uncovered strong potential to embark on such an initiative. The consultations identified several stakeholder groups within the national agricultural ecosystem in Bangladesh that are already actively involved in the management of agricultural data (data generation, aggregation, processing, analysis, sharing, use).

Why is this important?

In general, lack of reliable and trusted data to inform investments in agriculture and agribusinesses renders a country risky for investors. This lack of trusted data, often resulting from duplications of data systems, with different entities reporting

multiple figures on a single data point, can hinder private sector investment in the sector, which will deprive the economy of opportunities for steady economic growth, resulting in increased food insecurity, poverty and hunger.

There is currently poor co-ordination in the management of agricultural data, such as unique identifiers of farmers, traders, agribusinesses and other entities within the ecosystem (*user data*), and data on the substance for the entities, such as production data, agronomic data, weather data, financial data, soil data and transactional data (*content data*). This lack of co-ordination has led to fragmented databases, unwillingness of data-holders to share data, further duplication of data systems, operational inefficiencies, data collection fatigue on data subjects, failure to scale innovations based on data, unsuited policies being made based on these fragmented data points and a data power imbalance between the data-owners and data-holders.



The dialogue mentioned above was structured based on the Digital Agriculture Framework⁴ and Digital Fisheries Framework⁵ produced by the Commonwealth Secretariat. Pillar 2 of these frameworks deal with Data Infrastructure. In general, infrastructure powers societies, provides

fundamental services and systems that enable economies to function, allows for communication, facilitates the creation and growth of other systems and supports daily activities: shared public infrastructure such as roads, railways, telecommunication networks or power lines serve

as the fundamental building blocks that allow other innovations to thrive. Similarly, agricultural data management at a country level needs a model of DPI to power new innovations within the sector. This is what forms the foundation for the concept of the NAgDI as a model of DPI for agricultural data implementation in Commonwealth countries.

What should policy-makers do?

The NAgDI is likened to any national public infrastructure, such as rail or roads. A well-operating national road infrastructure has policies guiding its use; backbone technologies supporting multiple users; a business model to ensure maintenance and sustainability of the infrastructure; and a governance model that ensures the use of the policies, the technologies

and the business model. As a result, the design and implementation of the Commonwealth NAgDI has been conceptualised to cover four components: (i) data principles and policies; (ii) data systems and technologies; (iii) a marketing and business plan; and (iv) governance and administration.

The dialogue shared sufficient background knowledge of these concepts with the institutions represented, provided the opportunity for stakeholders to appreciate the existing digital assets in the country and enabled an informed assessment of the challenges and gaps. The outcome of the dialogue comprised recommendations generated by the participants themselves, on each of these components, generally related to the enabling environment to facilitate the establishment of the NAgDI.



Given the already existing systems and platforms that could be integrated into a NAgDI, and especially tapping into the ongoing work of a2i, recommendations for the implementation and management of the NAgDI in Bangladesh are summarised as follows:

Data Policies and Principles to guide the infrastructure: Bangladesh's independently strong institutions still require an oversight mechanism for the reform of regulations at national level, in support of the NAgDI. This may require a joint assessment of the need for and facilitation of convergence of the ongoing data management initiatives in the country. This will not only involve public institutions but also entail dialogues among public and private sector stakeholder institutions. The outcome of this oversight regulatory mechanism will be coherent and inclusive implementation,

monitoring and evaluation of the NAgDI. Such an oversight mechanism is best led or driven by the government at ministerial or inter-ministerial level.

Data Technologies and Systems in support of the infrastructure: Bangladesh has a strong technology base, but it still needs to identify a technology that bridges existing data systems in the country. The objective of such a technology would not be to establish a centralised data system but to reduce duplication and aim for the seamless integration of data from various sources, through interoperability of the systems. The DPI work already carried out by a2i provides a sound foundation to explore technology options for the backbone for data management. As an accompanying measure, an effort must be made to carry out a large-scale digitisation process of agricultural data across the country. While there has been leadership on the harmonisation of

data systems, led by para-public institutions and projects, this initiative could be led by the private or non-governmental sector.

In today's data-driven world, data standardisation and interoperability have become indispensable elements of effective DPI. By establishing common formats, structures and definitions for data, countries can unleash the power of data to enhance service delivery, promote transparency

and drive innovation. Hence the need for a structured approach to data management that ensures consistency, compatibility and interoperability. The ongoing initiative of the a2i in applying an approach to harmonise agricultural data standards in Bangladesh is highly commendable and could serve as a model for other countries in the Commonwealth to assess for adaptation and adoption.



Marketing and Business Planning for the infrastructure:

Marketing the NAgDI to attract initial financing, as well as developing its business plan, requires a strong approach to future investment options to ensure the sustainability of the infrastructure. While the NAgDI should have an open and free data component, there will also be a need to monetise parts of components. Partnership opportunities should be sought in support of the initial financing of the infrastructure, through seed funds, grants and loans, from development agencies, international financial institutions, etc. Meanwhile, revenue models to support the infrastructure should be explored, such as subscription fees, transaction fees, premium features, freemium, data licensing and sales, etc. This can best be achieved through the identification of customer segments such as financial

institutions, development agencies and investors as well as high-level macro products to be built by the infrastructure. This component could be led by the private sector.

Governance and Administration of the infrastructure:

The need to instil trust in the NAgDI system means that the public sector or the government will need to drive the process of ensuring the governance and administration of the infrastructure. Currently, the precise institutions needed to play this role are not in place in the country; however, capacity can be built by expanding the mandates of existing agencies and institutions to carry out the role in a transparent manner. For this component, transparency in implementation is crucial, to strengthen the other components of the NAgDI. Any organisation that leads such an initiative would have to play the

role of independent custodian representing all stakeholders but with a mandate from the national government.

The four components of the infrastructure function while content data and user data, acting as the 'resource', are pulled, harmonised, integrated, improved and pushed for macro-level decision-making.

Content data: Climate-resilient agricultural data is fundamental in addressing the current and future agricultural challenges posed by climate change, such as drought, floods and extreme weather events. It supports the development of early warning systems, climate-smart agriculture practices, financial services, inclusion, trade and informed policy-making. A co-ordinated approach to climate-resilient agricultural data through the NAgDI will align with global efforts to strengthen food security, adapt to climate change and achieve the Sustainable Development Goals. Ultimately, content data, including on soil, agronomy, markets, finance, weather, pests and diseases, is a vital resource in ensuring the resilience and productivity of the agriculture sector.

User data: When content data is linked with user data, a stronger business case can be made for both private and public sector investment options. The existence of an effective and operational national ID system has been shown to be a useful asset in the establishment of the NAgDI: a unique

functional ID system for all farmers can take root from the national ID system. However, the agricultural data infrastructure also requires that other stakeholders in the sector be identifiable through unique digital IDs (e.g. agribusinesses, institutions, networks, etc.). Another foundational layer of data relates to harmonising the mapping of polygons of farmers' fields (generally mapped by the Ministry of Lands), which can then be associated with a farm ID.

Endnotes

- 1 The Commonwealth (2018) 'Declaration on the Commonwealth Connectivity Agenda for Trade and Investment'. <https://thecommonwealth.org/connectivity-agenda>
- 2 Open Data Institute (2023) 'Understanding the Social and Economic Value of Sharing Data'. <https://theodi.org/insights/reports/understanding-the-social-and-economic-value-of-sharing-data-report/>
- 3 HM Treasury (2018) 'The Economic Value of Data'. Discussion Paper.
- 4 <https://state-digitalagriculture.thecommonwealth.org/digital-agriculture/introduction>
- 5 <https://state-digitalfisheries.thecommonwealth.org/digital-fisheries/introduction>

About the series: These Policy Briefs are the results of multi-stakeholder dialogues hosted by governments in selected countries in the Commonwealth and jointly organised by the Commonwealth Secretariat, acting as an honest broker, to bring actors together to design and develop a National Agricultural Data Infrastructure (NAgDI) for climate-related issues. These dialogues, involving relevant national stakeholders, are possible through financial support from the Open Society Foundations and in collaboration with Aspire to Innovate (a2i) in the case of Bangladesh.

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