



The Solutions Lab

Scaling for Sustainable Infrastructure

Integrated Upstream Planning: Guidance for International Actors, Countries & Cities

Thematic Brief

Why Integrated Upstream Planning is Key for Sustainable Infrastructure

True progress to fulfil the ambitious goals of the global agreements – the Paris Agreement, Convention on Biodiversity, Sendai Framework, and Sustainable Development Goals (SDGs), among others – is close to impossible if sustainability is addressed only one project at a time. Major efforts are needed “upstream” to strategically and spatially plan across sectors and with diverse stakeholder participation in order to prioritize infrastructure solutions that best balance potential trade-offs among economic viability, resilience, ecosystems and biodiversity, social equity, and service delivery (Figure 1 below).

The world already faced converging global crises in climate change, biodiversity loss, and socioeconomic inequality before COVID-19 that demonstrated a profound need for improvements in current infrastructure planning and development. The pandemic and the resulting global economic recession only further amplify the need for **integrated upstream planning approaches that build resilience and lay the foundations for sustainable and inclusive growth.**

Sustainable infrastructure is a powerful solution at the heart of these multiple global agreements designed to address these crises. Given the “lock-in effect” of infrastructure assets and that more than 75% of the infrastructure aimed to be built by 2050 is not yet in existence today (and up to 70% anticipated in developing countries), the timing is opportune to leapfrog into the sustainable development of the future.¹



FIGURE 1. THE INFRASTRUCTURE LIFE CYCLE - UPSTREAM PHASES²

Upstream Planning: Government-led processes to determine strategic and land use plans at the national, sub-national, or municipal scale, including for specific or large-scale infrastructure solutions, based on national government strategic development visions and sub-national, multi-stakeholder group determined priorities.

¹ Egler, H.P., Frazao, R., 2016. [Sustainable Infrastructure and Finance: How to Contribute to a Sustainable Future](#). Basel: Global Infrastructure Basel.

² Figure developed by The Solutions Lab.

Integrated Planning: Multisectoral, inclusive, multi-disciplinary, and stakeholder-based processes to determine priorities for infrastructure solutions that balance environmental, social, and economic aspects of sustainability across the entire lifecycle of infrastructure systems in the provision of essential services.³

Planning efforts are critical to not only reduce costs but also avoid worst case future climate change scenarios. Potential savings have been calculated to be as high as 40% (from 8% to 4.5% of GDP) to meet the infrastructure-related SDGs in developing countries.⁴

What are the Main Barriers to Integrated Upstream Planning?

Even with such clear evidence of the cost savings, especially in addressing the increasing physical and transitional risks of climate change,^{5,6,7} very few national or sub-national governments regularly carry out such integrated upstream planning. The Solutions Lab has identified the following common political economy and technical implementation barriers preventing wider implementation of integrated upstream planning:

1. Weak political will due to limited awareness of the benefits across all stakeholder groups;
2. Limited funding in “upstream” and integrated planning compared to individual projects, especially in developing countries;
3. Insufficient sector-specific data at the necessary scale;
4. Poorly designed or low capacity institutional structures or processes to manage more integrated upstream planning approaches.

How to Ensure Integrated Upstream Planning in Practice

Once a country is determined to implement and invest in sustainable infrastructure, **five essential criteria** must be met to overcome the above-mentioned barriers:

1. Forward-looking national strategic vision and planning framework

Effective integrated upstream planning can only occur with a clear vision of sustainable development set by the national government with buy-in from key relevant stakeholders. The admittedly multifaceted and sometimes conflicting goals of poverty reduction, sustainable development, biodiversity conservation, and climate change mitigation and adaptation need to be addressed simultaneously and systematically.⁸

2. Policy, institutional, and regulatory reforms combined with capacity building

Policy and regulatory reforms combined with human capacity building are essential for most countries to successfully implement integrated upstream planning. This is especially important given the heavily sector-siloed nature of infrastructure planning in many countries; and even robust planning institutions are newly challenged by the cross-cutting nature of climate extremes and their impacts, requiring innovation and investment.

³ UN Environment Programme, 2019. [Integrated Approaches to Sustainable Infrastructure](#). Geneva: UNEP.

⁴ Rozenberg, J. & Fay, M., 2019. [Beyond the Gap: How Countries Can Afford the Infrastructure They Need while Protecting the Planet](#). Washington, DC: World Bank.

⁵ *Ibid.*

⁶ Watkins, G., Mueller, S.-U., Ramirez, M. C., Serebrisky, T. & Georgoulas, A., 2017. [Lessons from Four Decades of Infrastructure Project-Related Conflicts in Latin America and the Caribbean](#). Washington, DC: IDB.

⁷ Hallegate, S., Rentschler, J. & Rozenberg, J., 2019. [Lifelines: The Resilient Infrastructure Opportunity](#). Washington, DC: World Bank.

⁸ Institution of Civil Engineers, 2019. [Enabling Better Infrastructure: 12 guiding principles for prioritising and planning infrastructure](#). London: ICE.

3. Innovative financial models to fund integrated upstream planning

Innovative new funding concepts that move away from individual projects to diversified portfolios that provide different kinds of return to different classes of investors (e.g. development banks take more risk than private, institutional capital) are one potential solution to insufficient funding upstream. A blend of green, social and municipal bonds with different interest rates attached as part of a 'master fund', for example, can finance integrated upstream planning that reduces risks for a portfolio of public-private-partnership investments in infrastructure projects.⁹

4. Evidence-based decision support through systems modelling

Systems modelling technology combined with increased satellite data availability should be introduced in order to enable integrated, multisector (ecosystems, energy, water, urban, health) modelling of complex, geographically large systems. While data availability continues to be a challenge in many countries, digitization and increasingly cheap computing power have made such models to inform strategic and spatial development planning highly cost-effective and powerful tools.¹⁰

5. Strong stakeholder engagement processes

Deliberate involvement of diverse coalitions of stakeholders, from multiple levels of government and the private sector to communities, indigenous populations, and other representatives of civil society is essential for any successful integrated upstream planning process. It not only avoids costs of potential expensive delays in future project implementation,¹¹ but is essential for determining and balancing development priorities amongst all groups.

Recommendations for international and domestic institutions

To facilitate integrated upstream planning globally at scale and ultimately drive investment toward sustainable infrastructure projects, we suggest the following actions for influential institutions involved in sustainable infrastructure.

International: MDBs, NGOs, Bilateral Aid Agencies

- Collaborate to **develop a universal high resolution digital model of the Earth** that includes links directly to, and shares data with, integrated systems modelling for people and ecology at national and sub-national / regional scales so that risk assessment for future scenarios for sustainable infrastructure designs and their impacts can be improved over time.
- **Allocate funding through existing multilateral platforms** explicitly targeted at developing countries to provide governments with resources dedicated to national and sub-national data-driven, integrated upstream infrastructure planning processes and capacity building for associate institutions.
- **Support the digitalization of infrastructure project preparation** to facilitate government access to best practices and technical assistance and improve data collection across the whole project lifecycle, including the use of systems modelling support tools (above) and most effectively target global goals in climate, biodiversity, SDGs, etc.

⁹ The Ecological Sequestration Trust, 2014. [Smart ways to mobilise more efficient and effective long-term investment in city regions](#). London: The Ecological Sequestration Trust.

¹⁰ See full [Guidance Note](#) of The Solutions Lab on Integrated Upstream Planning for additional detail, including requisite data and conceptual frameworks to support such modelling approaches.

¹¹ Watkins, G., Mueller, S.-U., Ramirez, M. C., Serebrisky, T. & Georgoulas, A., 2017. [Lessons from Four Decades of Infrastructure Project Related Conflicts in Latin America and the Caribbean](#). Washington, DC: IDB.

National planning ministries and departments

- **Update national integrated financing frameworks** that determine how national development and infrastructure strategies will be financed and implemented (considering all financial and non-financial means of implementation, e.g. public, private, domestic and international finance, technology and capacity building) to explicitly allocate funding to integrated upstream planning.
- **Create policies and capacity building programs that incentivize sub-national and local scale risk-based integrated upstream planning** to address urban-rural linkages and the health and resilience of people and the ecosystems that support them, while enabling smart choices to be made for sustainable infrastructure planning and delivery.
- **Create mechanisms to ensure diverse stakeholder engagement** in strategic and spatial planning processes for infrastructure solutions, including non-state actors (NGOs, the private sector) and local communities.
- **Create a data specification development plan** that includes data needs, collection strategies, specifications, handling, and brokerage for the full lifecycle of sustainable infrastructure investments; and has interoperability between different data sources. Match the data needs to those required for risk screening tools by funders; and support capacity building across different stakeholders around new data policies and data processing.
- **Update national building and infrastructure standards** in line with increasing climate risks and to enable new integrated systems solutions, including the potential for nature-based solutions, to be used.

State / regional planning departments

- **Adopt new integrated upstream planning tools** for cross-sector collaboration at regional (sub-national) and local scales so that landscape, urban, rural and infrastructure planners can apply integrated approaches that explicitly consider nature-based solutions and can evaluate and measure climate risks while connecting to project level sustainability and resilience standards.

Municipalities

- **Use systems models and data to implement performance-based procurement** for sustainable infrastructure so that public and private sector contracting parties are committed to delivering short- and long-term performance outcomes that match the sustainability and resilience needs of the community and the ecosystems that support them.
- **Strengthen planning functions within municipalities** by creating: multi-disciplinary teams with urban designers, planners, hydrogeologists, naturalists, architects, finance experts, and biodiversity experts to work together in a collaborative environment and engage in urban infrastructure planning and design; creating a centralized data platform to be used by these multidisciplinary teams; building capacity and increase funding for systems model application and development to support integrated upstream planning; and requiring that infrastructure investment funds flow through the multidisciplinary planning team to ensure investment decisions follow plans.



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