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Towards sustainable blue infrastructure finance:

The need, opportunity and means to integrate Nature-based Solutions into coastal resilience planning and investments

Key messages

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Disclaimers and Acknowledgements

This work has been made possible by the generous funds provided by the Government Offices of Sweden, Ministry of the Environment and Energy. The views expressed in this working paper do not necessarily reflect those of IUCN, the Government of Sweden and any other participating organisations.

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IUCN likes to express its sincere thanks to all the co-authors including Gerard Alleng (iADB), Andreas Biermann (EBRD), Emily Corwin (Conservation International), Stephen Crooks (Silvestrum), Philip Fieldhouse (Arup), Dorothée Herr (IUCN), Nathanial Matthews (Global Resilience Partnership), Aparna Shrivastava (Mercy Corps), and Jürgen Zeitlberger (IUCN). IUCN would especially like to thank Torsten Thiele (Global Ocean Trust), Nathalie Roth (4Climate) and Moritz von Unger (Silvestrum) for their substantial work on this paper.

IUCN also likes to thank all participants of the 2019 Madrid workshop for their contributions and review of this paper: Helen Agren (Swedish Ministry for Foreign Affairs); Ginette Borduas (Meridiam); Minna Epps (IUCN); Gianleo Frisari (IADB); Anup Jagwani (IFC); Andrew Johnstone (Climate Fund Managers); Karin Kemper (World Bank); Chris Knowles (Advisory Council Member at Climate Bonds Initiative and OECD Centre for Green Finance & Investment); Noelle Obrien (ADB); Emily Pidgeon (Conservation International); Gareth Philipps (AFDB); Karen Sack (Ocean Unite) and Barbara Schnell (KfW).

IUCN would also like to express its sincere appreciation to Irina Likhachova (IFC); Eva Mayerhofer (EIB) and Chandreyee Namhata (4Climate) for additional feedback and expert review.

Published by: IUCN, Gland, Switzerland, in collaboration with 4Climate, ADB, Arup, Conservation International, Flood Resilience Alliance, Global Ocean Trust, Mercy Corps, Meridiam, ORRAA and Silvestrum.

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Suggested citation: Thiele, T., Alleng, G., Biermann, A., Corwin, E., Crooks, S., Fieldhouse, P., Herr, D., Matthews, N., Roth, N., Shrivastava, A., von Unger, M. and Zeitlberger, J. (2020). *Blue Infrastructure Finance: A new approach, integrating Nature-based Solutions for coastal resilience*. IUCN, Gland, Switzerland.

Suggested citation for the related key messages document: Thiele, T., Alleng, G., Biermann, A., Corwin, E., Crooks, S., Fieldhouse, P., Herr, D., Matthews, N., Roth, N., Shrivastava, A., von Unger, M. and Zeitlberger, J. (2020). *Towards sustainable blue infrastructure finance: the need, opportunity and means to integrate Nature-based Solutions into coastal resilience planning and investments. Key messages*. IUCN, Gland, Switzerland.

Layout by: Imre Sebestyén, jr. / Unit Graphics

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This document is part of and informs the work of the Blue Natural Capital Financing Facility (BNCFF): www.bluenaturalcapital.org.

Other reports in this series include:

Blue Bonds: Financing Resilience of Coastal Ecosystems and Sustainable Growth. Key Points for Enhancing Finance Action

Blue Natural Capital Positive Impacts Framework

"Stupid infrastructure still has a business case, making us more vulnerable with every dollar we invest."[1]

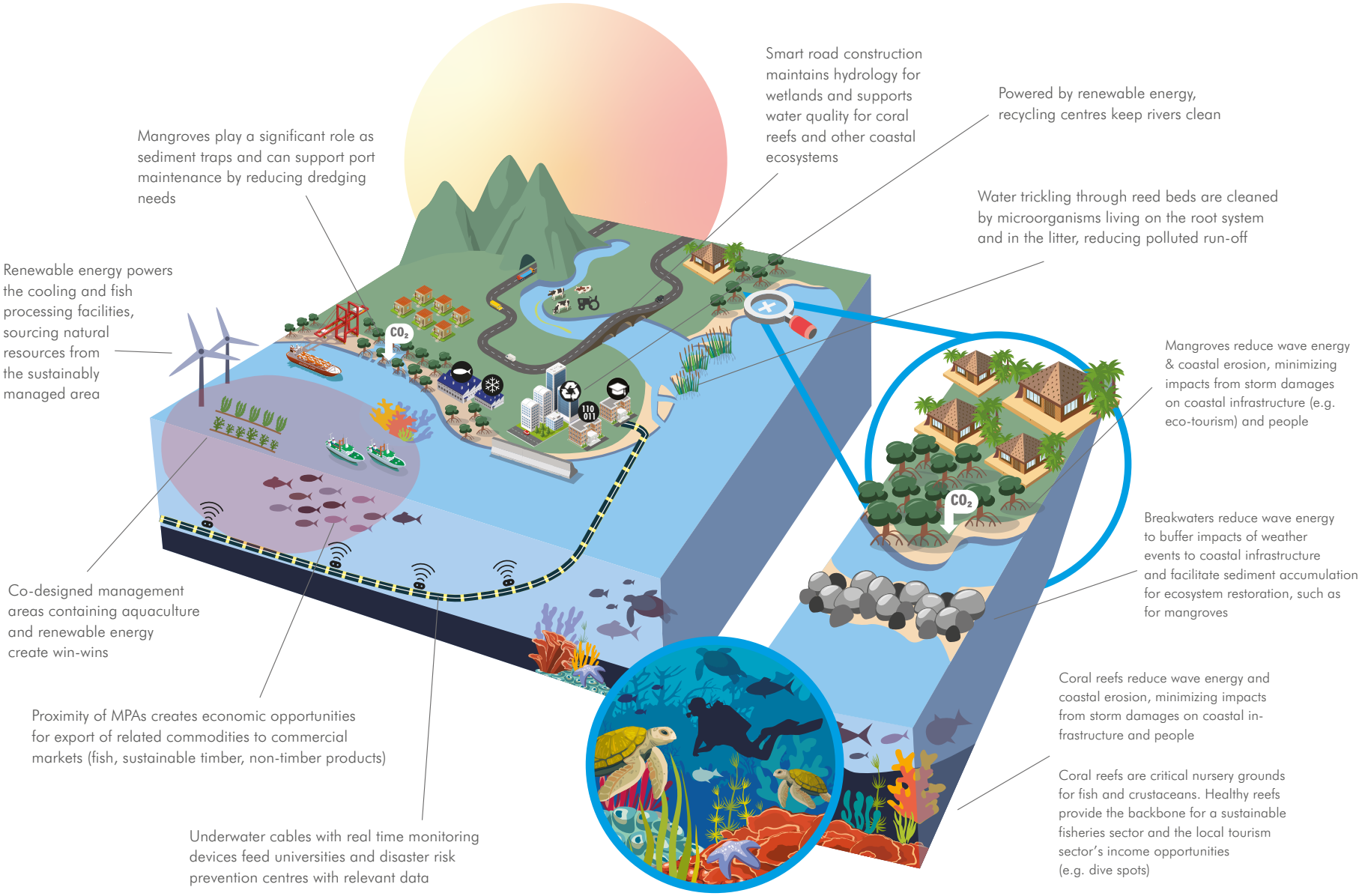
Infrastructure is key to economic and social development, yet often has negative environmental impacts. Coastal and marine life, in particular, is at risk[2] to be damaged. Additionally, the global ocean economy is critically exposed to climate change[3]. Nature-based solutions (NbS) anchored in and serving habitats like mangroves, seagrasses and coral reefs, can help to make infrastructure investments better, more resilient (Graph 1) and financially more attractive (Graphs 3 and 4). In comparison, coastal infrastructure without NbS (Graph 2) largely ignores benefits and services from nature and thus misses other economic opportunities and increases risk (Graph 5 and 6). Redesigning infrastructure to achieve net-zero emissions and no net biodiversity loss, and even increasing biodiversity (biodiversity net gain), is a critical challenge that requires new approaches, including in terms of finance.

Financial mechanisms are needed to support a paradigm shift away from infrastructure investments in sectors with unclear or negative impacts on nature (sometimes referred to as "grey finance") towards infrastructure investments that provide transport, clean water and energy as well as flood and erosion control, *and* protect and enhance natural habitats in coastal and marine areas ("blue finance"). **New blended finance solutions integrating Blue Natural Capital (BNC) can play a critical role for this transition.** Such solutions can help de-risk blue infrastructure investments, while specifically attracting a suite of private actors, including impact investors. If successful, it will have broad ecological benefits and cascading effects on the coastal and marine systems on all levels[4].

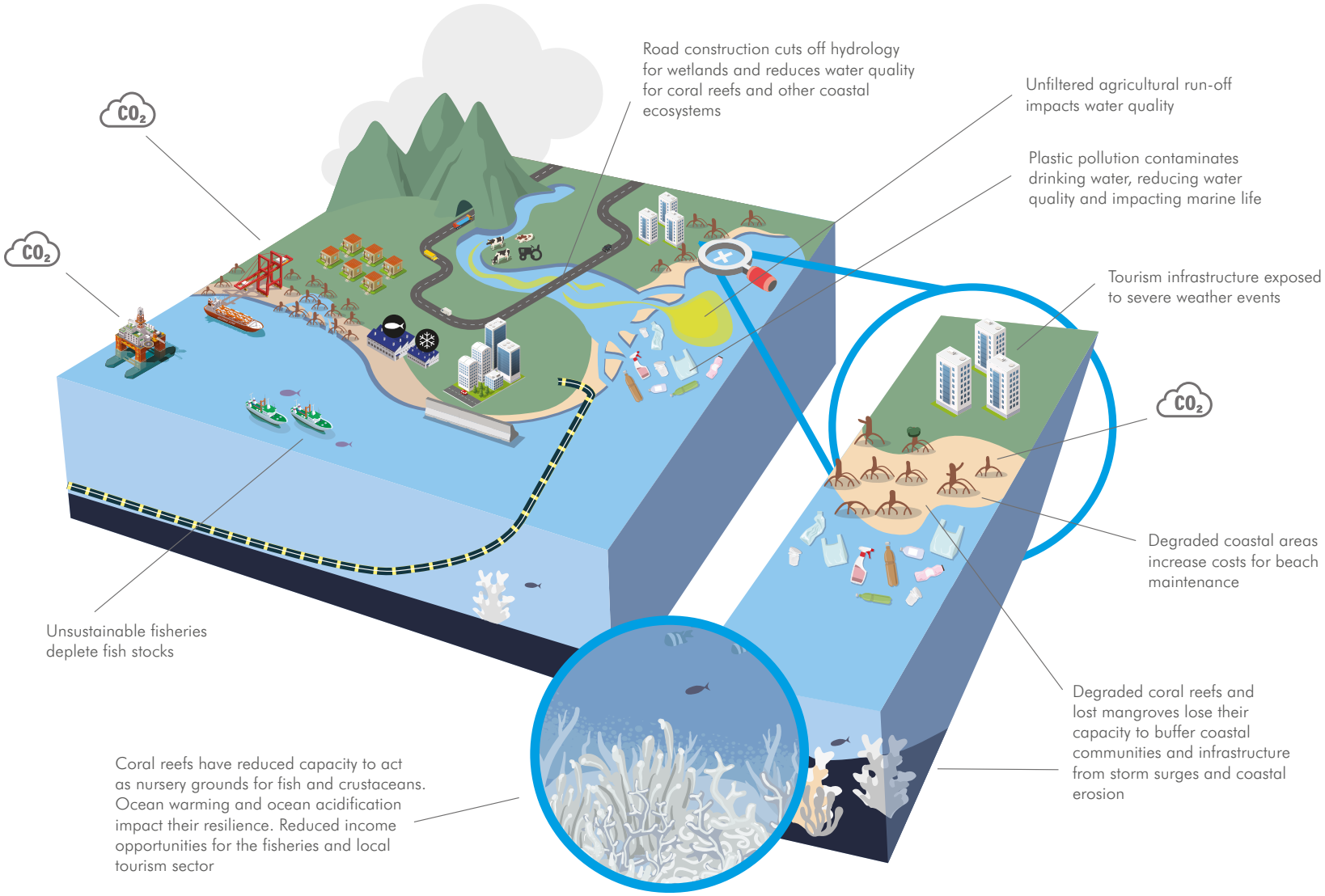
Blue infrastructure finance can therefore help to generate positive impacts on coastal and marine ecosystems, alongside significant economic benefits (Graphs 3 and 4). Cost-Benefit-Analysis (CBA) of resilient infrastructure is still evolving, but research shows that the economic benefits of resilient infrastructure investments from reducing climate risks provide long-term returns which far exceed the cost of investment; as a recent World Bank study[5] suggest, at a ratio of 5 to 1. When accounting for the multiple non-economic benefits of resilience approaches, as for instance the Global Ocean Accounts Partnership aims to do, returns will be even higher[6].

1 Financial Times Weekend, 02.02.2020
2 https://www.nature.com/articles/s41467-019-12808-z
3 https://www.oceanpanel.org/sites/default/files/2019-12/expected-impacts-climate-change-on-the-ocean-economy.pdf
4 Laffoley, D., Baxter, J.M., Amon, D.J. et al. Eight urgent, fundamental and simultaneous steps needed to restore ocean health, and the consequences for humanity and the planet of inaction or delay. Aquatic Conservation: Marine and Freshwater Ecosystems. https://doi.org/10.1002/aqc.3182 .
5 Hallegatte, S., Rentschler, J., Rozenberg, J. 2019. Lifelines : The Resilient Infrastructure Opportunity. Sustainable Infrastructure. Washington, DC: World Bank.
6 https://www.unescap.org/events/global-dialogue-ocean-accounting-and-first-annual-meeting-global-ocean-accounts-partnership

Graph 1: Coastal infrastructure with NbS (Blue Infrastructure)

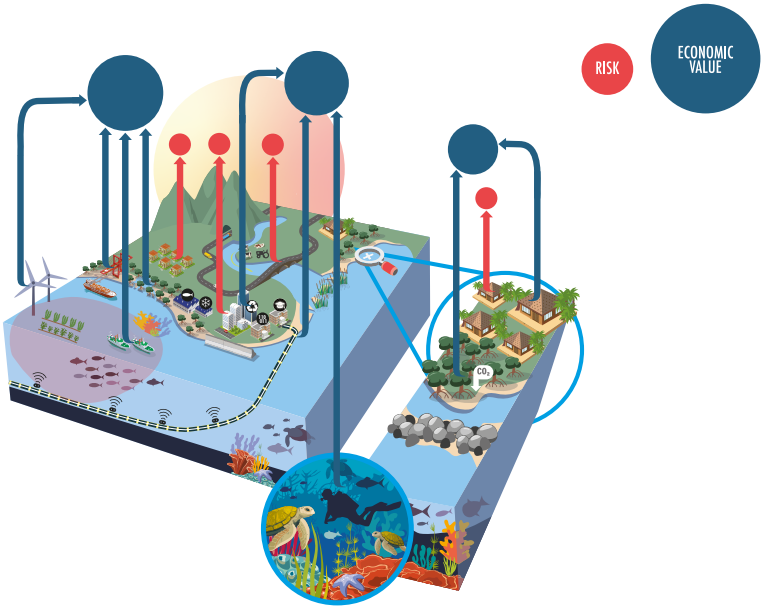


Graph 2: Coastal infrastructure without NbS



Graph 3. Conventional approach to infrastructure

Development is focused on individual assets with identified predictable cash flows. Benefits and services from nature are largely ignored. Development is focused on individual assets with identified predictable cash flows. Benefits and services from nature are largely ignored. Negative impacts on services from nature are not internalised into the CBA. Other economic opportunities are missed. There is vulnerability to external factors like natural disasters, extreme weather events and slow on-set events such as sea-level rise.

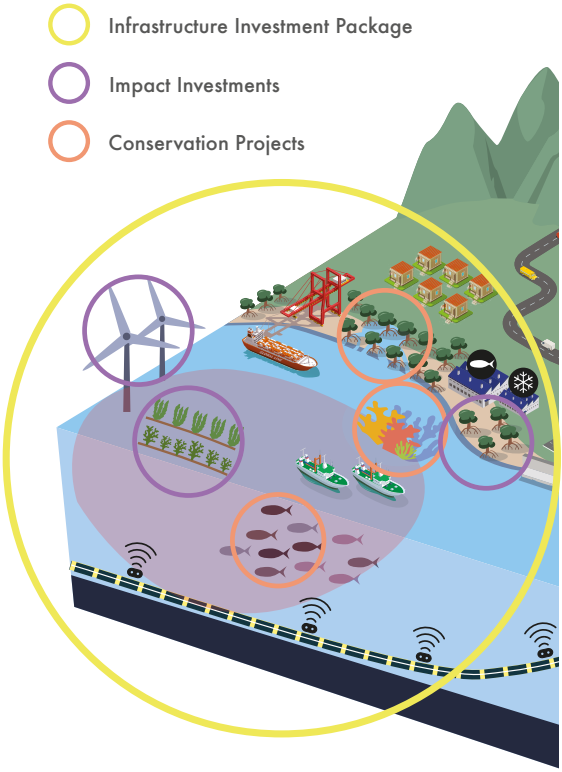


Other economic opportunities are missed. There is vulnerability to external factors like natural disasters, extreme weather events and slow on-set events such as sea-level rise.

Arrows and circles for illustration only.

Graph 4. Blue infrastructure finance

Blue infrastructure projects are designed with a holistic view, integrating the broader land and seascape, financing a wider range of project components that optimise green-grey infrastructure. Conservation project components funded in parallel reduce other risks. New revenue generating opportunities for local communities are created. Investment opportunities for impact investors and other private sector partners are promoted.



Graph 5. Conventional approach to infrastructure

Development is focused on individual assets with identified predictable cashflows. Benefits and services from nature are largely ignored. Negative impacts on services from nature are not internalised into the CBA. Other economic opportunities are missed. There is vulnerability to external factors like natural disasters, extreme weather events and slow on-set events such as sea-level rise.

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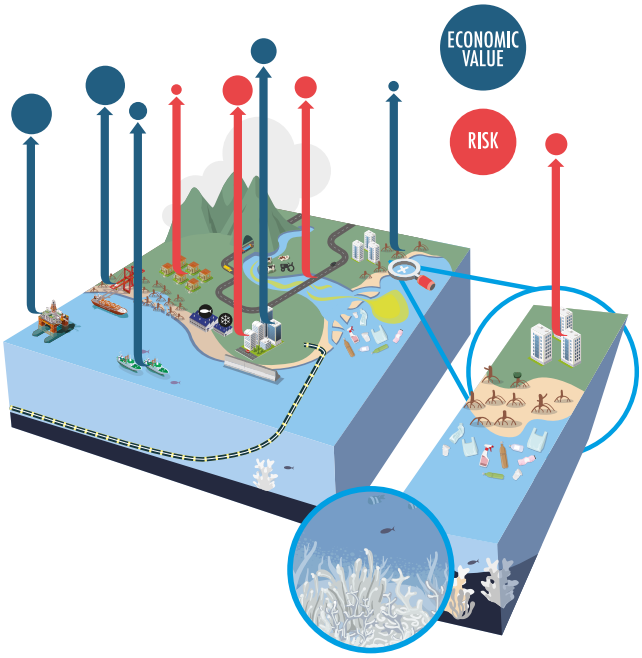

Graph 6. Conventional investment.

Investments focus on grey infrastructure only.

Conservation projects are funded by donors and/or public funding in isolation and have limited reach. There are limited revenue generating opportunities for local communities, conservation projects don't maximise on communities community involvement and few investment possibilities exist for private financiers, including impact investors.

Nature-based blue infrastructure solutions achieve "biodiversity net gain"[7] outcomes. Biodiversity Net Gain is an approach to development that leaves biodiversity in a better state than before. NbS can reduce the maintenance costs of grey infrastructure, they are shown to be cost-effective, with many associated social and environmental benefits[8]. For example, integrating wetland restoration with rock breakwaters combines the wave attenuation and flood control value of wetlands with the benefits of engineered structures to stabilize the coastal zone. A more holistic approach is required for the protection and growth of BNC, in addition to Marine Protected Areas (MPAs). Natural capital thinking should be applied when implementing marine regulation and decision-making.[9]

Yet, specific barriers for securing adequate resources to finance blue infrastructure projects hamper quick progress:

- Lack of evidence to demonstrate how ecology and infrastructure interact or can interact (flooding and walls, wetlands and roads, and so on) to achieve synergistic outcomes;
- Lack of experience, standards and sufficient examples to overcome institutional emphasis in favour of purely conventional or 'proven' grey infrastructure; linked to
    - Confidence based on historic data globally that grey infrastructure will deliver required benefits;
    - Failure to recognize or tendency to underestimate long term maintenance or decommission costs and responsibilities, and
    - Higher design tolerances of grey infrastructure potentially leading to long term project failure or unforeseen upgrade costs (e.g. reduced flood protection benefits of levees with higher rates of sea level rise or reservoir storage capacity driven by upstream water or sediment management);
- Lack of granular, site-specific knowledge of specific infrastructure risks and nature based risk mitigation strategies (such as to reduce flooding and the exposure to sea-level rise);
- Lack of confidence within the broader audience and the finance community in particular that nature based solutions will provide the predicted protection and ecosystem benefits;
- Lack of dedicated finance facilities focusing on developing BNC projects and offering blended finance solutions;
- Lack of institutional models and arrangements capable of channelling finance to stakeholders concerned; and
- Lack of partnership models for delivering those projects.

Overcoming these barriers while addressing the imbalance between conventional and blue infrastructure finance requires investors to recognize the benefits from the value

7 Biodiversity Net Gain is an approach to development that leaves biodiversity in a better state than before.
8 Watkins, G.G. et al. (2019). Nature-based Solutions: Scaling Private Sector Uptake for Climate Resilient Infrastructure in Latin America and the Caribbean. DISCUSSION PAPER No. IDB-DP-00724.
9 Helm, D. (2020) State of Natural Capital Annual Report 2020 Natural Capital Committee. NCC Secretariat. London.

of coastal and marine habitats and the opportunities they provide for sustainable and resilient investments.

This calls for a number of complementary measures:

First, the design of blue investment models (blue prints) with the potential of replicability and scalability.

Second, in tandem with these models, the development of distinct methods and granular tools to trace and to track impact and synergies; between resilience and infrastructure; between digital solutions; and early warning systems and between livelihood improvement and habitat protection.

Third, often non-integrated infrastructure finance is perceived to be less expensive in the shorter term but blue infrastructure finance represents better cost-benefit value in the medium to longer term. Due to economic discounting, project approvals are often made by considering only the current and short-term costs and not the long-term costs. Bringing forward benefits and delaying costs, or securing very patient capital, are often necessary to close blue infrastructure deals.

Fourth, project approvals and finance are often more influenced by political realities than Cost-Benefit-Analysis (CBA) and subsidies are bolstering the status quo, so solutions to remove harmful subsidies and introduce incentives that enable blue infrastructure investments need to be considered. Addressing those broader challenges and engaging the beneficiaries of inclusive measures in the wider society need to be part of the approach.

Fifth, the identification of adequate institutional support – spearheaded by multilateral development banks (MDBs) – as well as public policies, regulatory frameworks and incentive mechanisms to promote blue infrastructure investments.

Under the concept of Blue Natural Capital (BNC) IUCN is working with projects[10] that aim to protect, restore and enhance natural ecosystems to better support climate change adaptation and mitigation efforts whilst conserving biodiversity and coastal and marine ecosystems. Mangroves for instance can substantially reduce the vulnerability of the adjacent coastal land from inundation and erosion, and there are constructive infrastructure solutions – for communities, as well as business – that can be built with mangrove restoration at its core. BNC uses these solutions and brings them into a suitable investment format. MDBs have also taken on board this effort with programs focusing on the restoration efforts of blue carbon.[11]

10 BNCFF (2019). Taking projects from blueprint to financial close' [website].

11 The Inter-American Development Bank implemented in 2019 a blue carbon program focusing on the restoration of mangrove systems within Latin America and the Caribbean, with the objective of climate change mitigation and adaptation, biodiversity conservation, poverty alleviation and coastal zone management, and mobilization of private and public sector resources for innovative approaches to conservation and natural capital development.

Around 70% of global greenhouse gas emissions come from carbon-intensive infrastructure. Redesigning this infrastructure to achieve net-zero emissions – and channelling investments for that purpose – is a critical challenge and need. Coastal systems do not only store massive amounts of carbon, much of it at risk of release, and offer additional carbon dioxide sequestration opportunities, but they also deliver several adaptation and coastal protection benefits.

Engineers and planners, in particular, face a significant challenge to adapt infrastructure to meet demand in increasingly complex environments, to higher specifications of resilience and at a time when investment in global infrastructure is significantly lower than what is necessary to achieve this. For BNC to support future infrastructure development, planners, engineers and financiers have to receive comprehensive guidance and create the appropriate partnerships that deliver on safeguarding coastal and marine areas, while reducing stressors on the ocean.

MDBs have a key role to play in delivering the substantial investment needs of developing countries in the field of sustainable infrastructure, climate change and biodiversity, and are already cooperating on appropriate frameworks and metrics[12].

The role of MDBs in blue infrastructure can be to

1. **provide substantial investment;**
2. **lead frameworks, standards and metrics; and**
3. **provide much-needed credit enhancements / guarantees, first-loss capital, patient capital, stacking and diversifying capital, etc. Sometimes private finance may be sufficient and can get over the line with a MDB credit enhancement.**

The Inter-American Development Bank (IADB), for example, recently launched a review entitled: "Nature-Based Solutions: Increasing Private Sector Uptake for Climate-Resilience Infrastructure in Latin America and the Caribbean"[13]. At least some of the sustainable infrastructure requirements in developing countries will have to be delivered through the private sector, with MDBs acting as a catalyst[14]. At the project level, MDBs, together with development finance institution (DFIs) and other international bodies can support access to grant and concessional resources from bilateral or multilateral donors, and these can be used to prepare projects, bring down the cost through blended financing approaches, and thereby, enhance the affordability of sustainable blue infrastructure.

Clear frameworks are needed for financial institutions lending to infrastructure projects as well as investors of such projects in coastal and marine areas. Standards and classification systems for sustainable financial instruments have emerged,

12 Joint MDB IDFC Technical Paper (2019). A Framework and Principles for Climate Resilience Metrics in Financing Operations. DISCUSSION PAPER No. IDB-DP-00722.
13 Watkins, G.G. et al. (2019). Nature-based Solutions: Scaling Private Sector Uptake for Climate Resilient Infrastructure in Latin America and the Caribbean. DISCUSSION PAPER No. IDB-DP-00724.
14 Löfqvist, S. and Ghazoul, J. (2019). Private funding is essential to leverage forest and landscape restoration at global scales. Nature ecology & evolution, 3(12), pp.1612-1615.

especially in Europe but with global application, that address NbS and marine biodiversity. The Climate Bond Climate Water Infrastructure Criteria assist the bond market by offering investment criteria for nature based solutions in addition to the Resilience Principles. In the EU, countries have recently agreed[15] a classification system ("taxonomy") for sustainable economic activities to be used by governments and financial market participants when reporting on their sustainable investment activities. The sustainable use and protection of water and marine resources is one of the six environmental objectives that this taxonomy aims to capture. Ongoing work offers the opportunity to firmly establish the concept of blue infrastructure within the taxonomy and to formulate investment blueprints that respond to the taxonomy by tailoring coastal infrastructure projects at large along their climate adaptation, mitigation and biodiversity values.

International rules and standards governing infrastructure investments and promoting blue investments over grey ones have to be strengthened, and foreign direct investment (FDI) needs to be attuned to the imperatives of sustainable blue finance. **Little attention has so far been paid to the potential for conceptual linkages in which both trade law and a nature-based agenda complement, notably in the field of blue investments, rather than contradict or undermine each other.** This explains the mostly passive placement of sustainability issues in trade and investment agreements. It also explains why sustainability issues, when they do become real and concrete concerns in a specific trade/investment relation, are often the subject of critique, if not outright legal challenges. A scenario approach such as the ARUP 2050 scenarios report can help to show how incentives creates different outcomes[16].

For developing countries, blue infrastructure investments come with the potential of accessing climate finance mobilized within the framework of the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement. The 2015 Paris Agreement, in particular, has grown increasingly attentive to the needs for blue infrastructure finance, with over 150 countries referring to blue carbon ecosystems in their national climate mitigation and adaptation goals (National Determined Contributions or NDCs[17]). Jointly with the commitments for the 2030 Sustainable Development Goals (SDG) – including the Ocean Goal SDG 14[18] – as well as the emerging post 2020 architecture under the Convention on Biological Diversity (CBD), a strong incentive framework is emerging to integrate public planning, conservation action and sustainable private investment. There are several climate-related bilateral initiatives, regional and multilateral channels to help developing countries in mitigation and adaptation to climate change, which can also support blue infrastructure projects.

15 Proposal for a Regulation of the European Parliament and of the Council on the establishment of a framework to facilitate sustainable investment (Approval of the final compromise text), Council of the European Union, 14970/19 (17 December 2019).
16 ARUP (2019) 2050 Scenarios: four plausible futures.
17 Martini, C. (2019) Understanding blue carbon requests in the NDC partnership [online blog].
18 Sustainable Development Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.

Alongside enhanced international climate and sustainability cooperation, a new set of financial instruments is emerging. Sustainability and resilience bonds, green and blue bonds[19], national and regional carbon markets and results-based finance mechanisms provide opportunities to accompany the transition towards a sustainable blue infrastructure.

Investors need to be aware how natural infrastructure functions better to realize projected benefits, reduces costs and to secure returns on investment. This requires applying systems-based, robust and precise climate impact and other SDG metrics. Especially long-term investors are starting to make climate resilience a pre-condition for investment and integrate it into investment analysis.

Governments need to establish clear and aligned public policies to enable and mandate climate resilience requirements, using nature-based solutions, covering the entire infrastructure life cycle of such projects in coastal and marine areas, in particular in developing countries.

To de-risk investment in nature-based and hybrid solutions we need to build confidence with a broad range of stakeholders that these investments can provide the predicted protection and ecosystem benefits. Pilot projects can help to build the science and evidence base.

There are several climate-related bilateral initiatives, regional and multilateral channels to help developing countries in mitigation and adaptation to climate change, which can be used to help blend in private finance in order to reduce risks.

Such support can come in different forms, ranging from design stage grants, technical assistance in preparing projects for investment, guarantees, risk insurance, as well as concessional capital, potentially coupled with results-based payments for specific, verified outcomes. Carbon market mechanisms can contribute to filling some of the gaps between financing needed for blue infrastructure and the financing available. Further work is required to also build markets for adaptation, biodiversity and resilience credits as well as integrated products such as BNC credits. There is an observed demand from companies to understand their wider impacts on nature across the entire value chain and to offset those parts of their carbon emissions that they cannot yet eliminate on a voluntary basis. Alongside the urgent need to increase conventional funding for coastal and marine conservation, market mechanisms need to be integrated into blue infrastructure finance to also deliver blue gains.

19 Roth, N. et al. (2019) Blue Bonds: Financing Resilience of Coastal Ecosystems. A technical guideline prepared for IUCN. Key Points for Enhancing Finance Action. IUCN, Gland, Switzerland.

The full report, with additional background information, can be found here.

Thiele, T., Alleng, G., Biermann, A., Corwin, E., Crooks, S., Fieldhouse, P., Herr, D., Matthews, N., Roth, N., Shrivastava, A., von Unger, M. and Zeitlberger, J. (2020). *Blue Infrastructure Finance: A new approach, integrating Nature-based Solutions for coastal resilience.* IUCN, Gland, Switzerland.

The Blue Natural Capital Financing Facility is supported by The Government of the Grand Duchy of Luxembourg, Ministry for Environment, Climate and Sustainable Development, and led by the International Union for Conservation of Nature (IUCN).

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