

Natural Infrastructure for Business

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What is natural infrastructure?



Natural Infrastructure is a planned or managed (often engineered), natural or semi-natural system designed to fill a specific need. It is a term that refers to ecosystems providing services and benefits that can substitute or complement traditional gray infrastructure.

Natural vs Gray infrastructure

Gray Infrastructure

Shoreline protection and flood control



e.g. levees; sea walls

Natural Infrastructure



e.g. oyster reefs, mangroves etc.

Wastewater treatment



e.g. water treatment facility



e.g. wetlands; reed beds

Why does it matter?

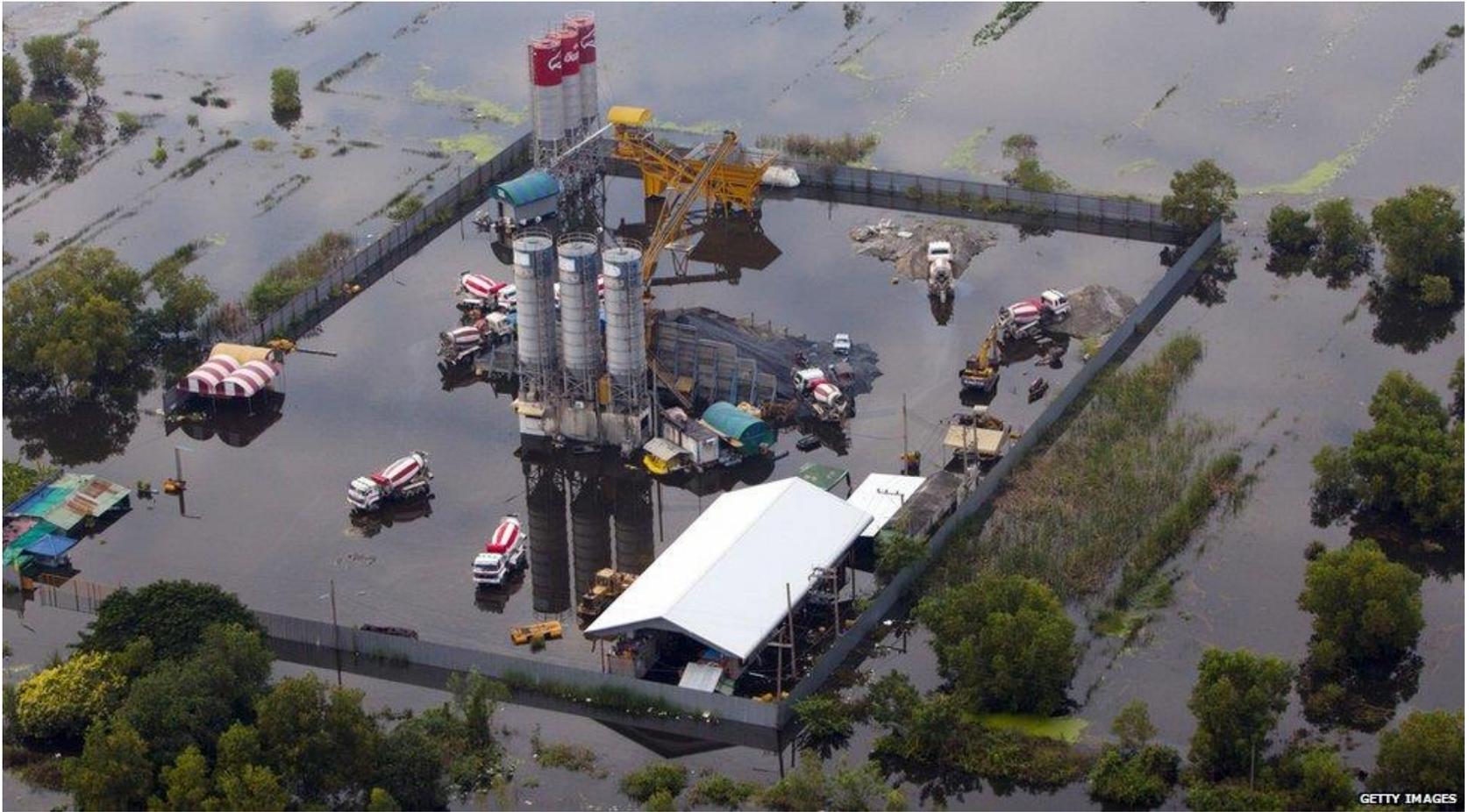
- ❖ Business & ecosystems are linked;
- ❖ 60% of the world's ecosystem services have been degraded over the past 50 years - a degradation that, when taking into account the change in land use, is responsible for about 20% of carbon emissions globally.
 - This trend must be reversed to secure resources, reduce risk exposure and create value for society and the environment;
 - Opportunity to channel infrastructure investment spending is enormous.
- ❖ Businesses are increasingly facing risks from climate change.
 - NI solutions can offer a means of resilience or future adaptation to these hazards.

What could be the motivations for companies to invest in NI (business drivers)?

1. Resource limitations
2. Regulatory requirements
3. Stakeholder concerns / Reputation
4. Changing climate and severe weather events



Business driver: changing climate and severe weather events



Source: BBC News October 2011, Thailand floods hurt businesses

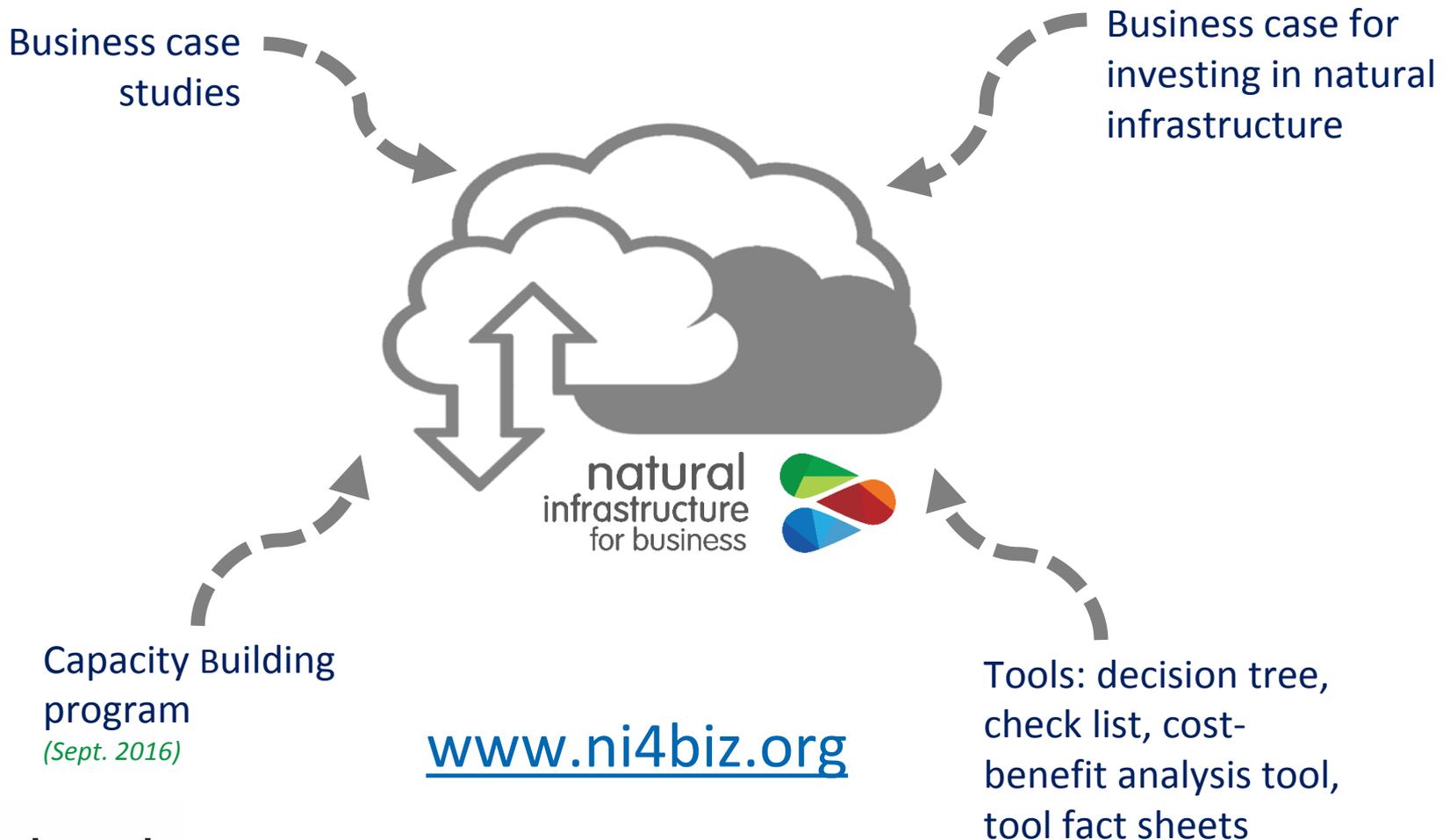
- Protecting or restoring coastal habitats can help absorb the energy and flood waters associated with coastal waves and storm surges.



Figure 2. Left: Yala National Park, Sri Lanka and nested ecotourism resort. Photo credit: B. McAdoo; Right: Yala Safari resort, Sri Lanka. Photo credit: B. McAdoo

Natural Infrastructure for Business Platform

Assessing and investing in natural infrastructure becomes common practice by 2020



Natural Infrastructure for Business

WBCSD Ecosystems & Landscape Management and Water Clusters



■ Solution Group Members:

Companies: APRIL, ARCADIS, Bayer, Cemex, CH2M, CP Group, Dow, DSM, EDF, EDP, Eni, ERM, EY, Fibria, Heineken, Jain Irrigation, JP Morgan Chase, KPMG, Lafarge Holcim, Mitsubishi, Mondi, Monsanto, PepsiCo, Pöyry, PwC, SABMiller, SCG Cement, Shell, Somo Japan, Statoil, Suez Environnement, Suncor Energy, Sweco Environment, Syngenta, The Navigator Company, Total, UltraTech Cement Limited, Vale, Veolia, Volkswagen, Votorantim Cimentos

Global Network: BCSD El Salvador, BCSD Portugal, BCSD Singapore, BCSD Turkey, BEC Hong-Kong, CEBDS Brazil, EpE, FIBS, Indonesia BCSD, Ireland BCSD, Philippine Business for the Environment, Sustainable Business Australia, UK BCSD, US BCSD



Dow's natural capital journey over the past 20 years



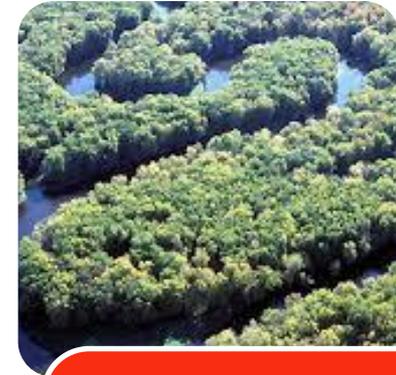
Seadrift Constructed Wetland

- NPV of cost savings = \$280MM



Nature is valuable

- Collaboration with TNC
- Revising business decision-making processes
- New tools
- Publications



Natural Infrastructure Projects

Conservation Monetization

2025 Sustainability Goals



Leading the Blueprint

Dow leads in developing a societal blueprint that integrates public policy solutions, science and technology, and value chain innovation to facilitate the transition to a sustainable planet and society.



Delivering Breakthrough Innovations

Dow delivers breakthrough sustainable chemistry innovations that advance the well being of humanity.



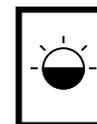
Advancing a Circular Economy

Dow advances a Circular Economy by delivering solutions to close the resource loops in key markets.



Valuing Nature

Dow applies a business decision process that values nature, which will deliver business value and natural capital value through projects that are good for the company and good for ecosystems.



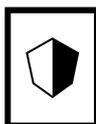
Increasing Confidence in Chemical Technology

Dow increases confidence in the safe use of chemical technology through transparency, dialogue, unprecedented collaboration, research, and our own actions.



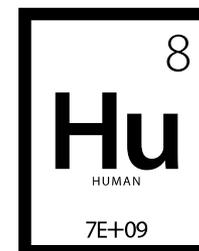
Engaging Employees for Impact

Dow people worldwide directly apply their passion and expertise to advance the well being of people and the planet.



World-Leading Operations Performance

Dow maintains world-leading operations performance in natural resource efficiency, environment, health, and safety.



Dow's 2025 Nature Goal



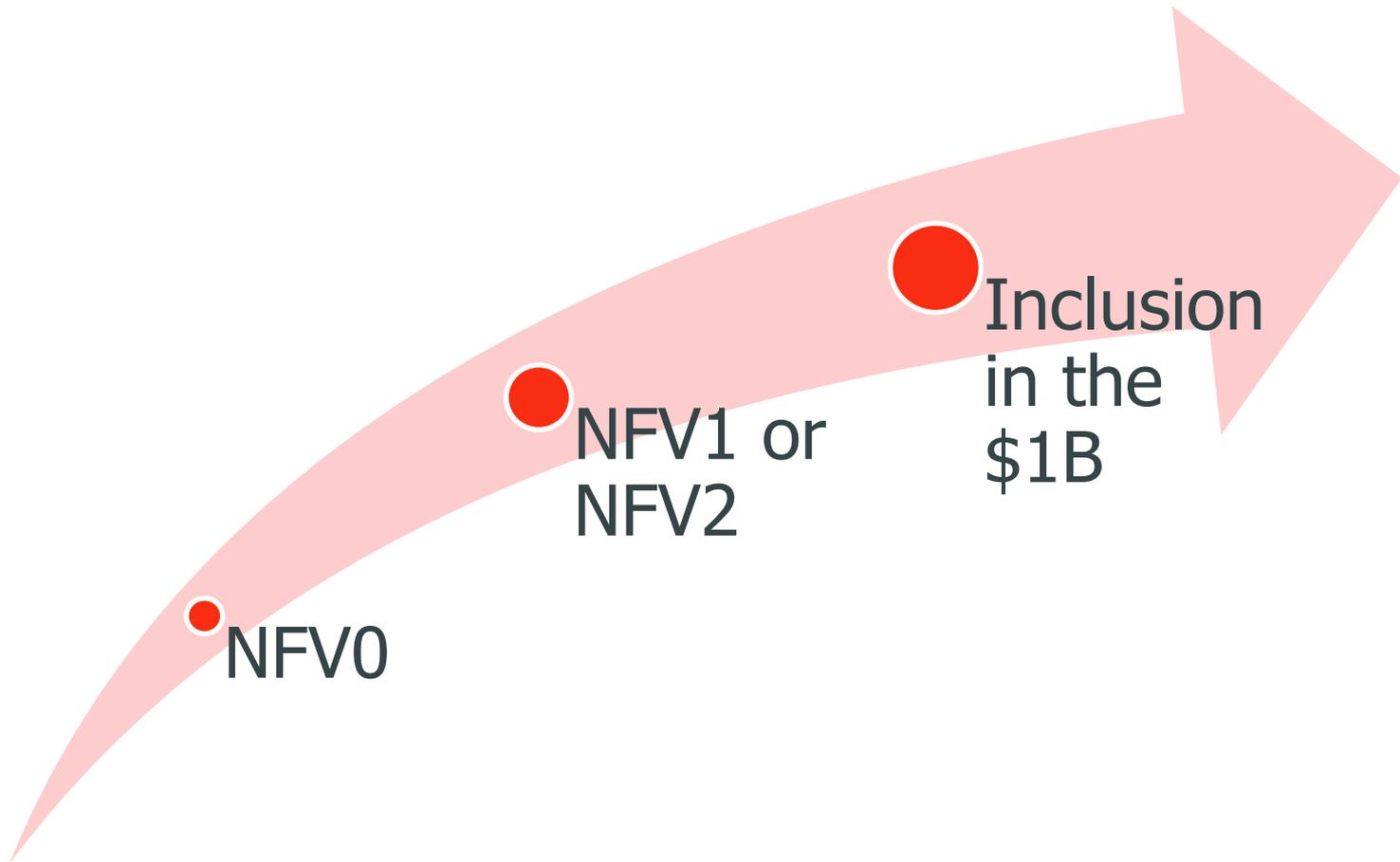
Our Goal is to apply a business decision process that values nature. Dow will deliver business value and natural capital value through projects that are good for business and good for ecosystems.

- By 2025, Dow will **identify \$1B in value through projects that are good for business and good for ecosystems.**
- By 2020, **all R&D, capital and real estate projects at Dow will be screened** using Nature's Future Value (NFV) assessments, a tool we developed with The Nature Conservancy to measure the value of ecosystem services.

Two main components of Dow's 2025 Nature Goal

- 1) **NFV - Nature's Future Value.** The business decision process that will help us quantify our impact (positive and negative) on ecosystem services.
- 2) **NPV – Net Present Value.** The value that we will generate over time in cost savings or revenue, discounted to present day dollars.

NFV – a business process that will help us find the right projects



NPV will come from 4 types of projects

Engineered Natural Technologies

- Green or natural infrastructure that provides the same services as grey infrastructure
- Example: Seadrift Wetland

Process Improvements

- Resource efficiency improvements that reduce impact on nature
- Example: Water recycling projects

Property

- Putting land (greenbelt or surplus) into conservation
- Example: Croydon Woods

Innovation

- New products that will enhance nature
- Example: DAS traits that help plants resist drought

Seadrift: Overview

The problem: Dow's Seadrift site needed to increase the level of water treatment to meet EPA effluent guidelines for suspended solids.

The solution: Dow converted 110 acres of an existing treatment pond into a constructed wetlands for the purpose of naturally treating these suspended solids.

The benefits: Recently, Dow conducted an economic and full life cycle analysis. The net present value of the savings totals more than \$200 million and the area serves as great habitat for fish, alligators, raccoons, bobcats, deer and a large number of birds. The wetland also requires no electricity, greatly reducing fossil fuel energy use.



vs.



Seadrift: The Drivers

- **Expense of the conventional option:** The conventional technology was \$40 million, so leaders were open to other solutions. The constructed wetland cost only \$1.4 million.
- **The local team:** This was an example of great outside of the box thinking by one man and great support for the idea by site leadership.
- **The ability to test the technology:** Dow started with a pilot plant and then scaled up once the performance had been proven.



Engineered Natural Technologies: Beyond Seadrift

- We implemented a similar natural wastewater treatment project in Freeport and have a team of people **evaluating these opportunities around the world.**
- We recently co-authored a **white paper on green infrastructure** and its inclusion in business decisions.
- Our land management team is looking at ways to put **land permanently into conservation** to benefit Dow and the public.
- The Dow – TNC Collaboration has developed **the Ecosystem Services Identification and Inventory (ESI) Tool**, a tool that allows an engineer or plant manager to assess his site for services that nature can provide and will guide decisions about natural technologies or land use. See esiitool.com



Redefining the Role of Business in Society.

Sustainability is our commitment. This is how our employees make it happen.

#DOW2025

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