Tailwind

Taxonomy for Climate Adaptation and Resilience Activities

May 2024

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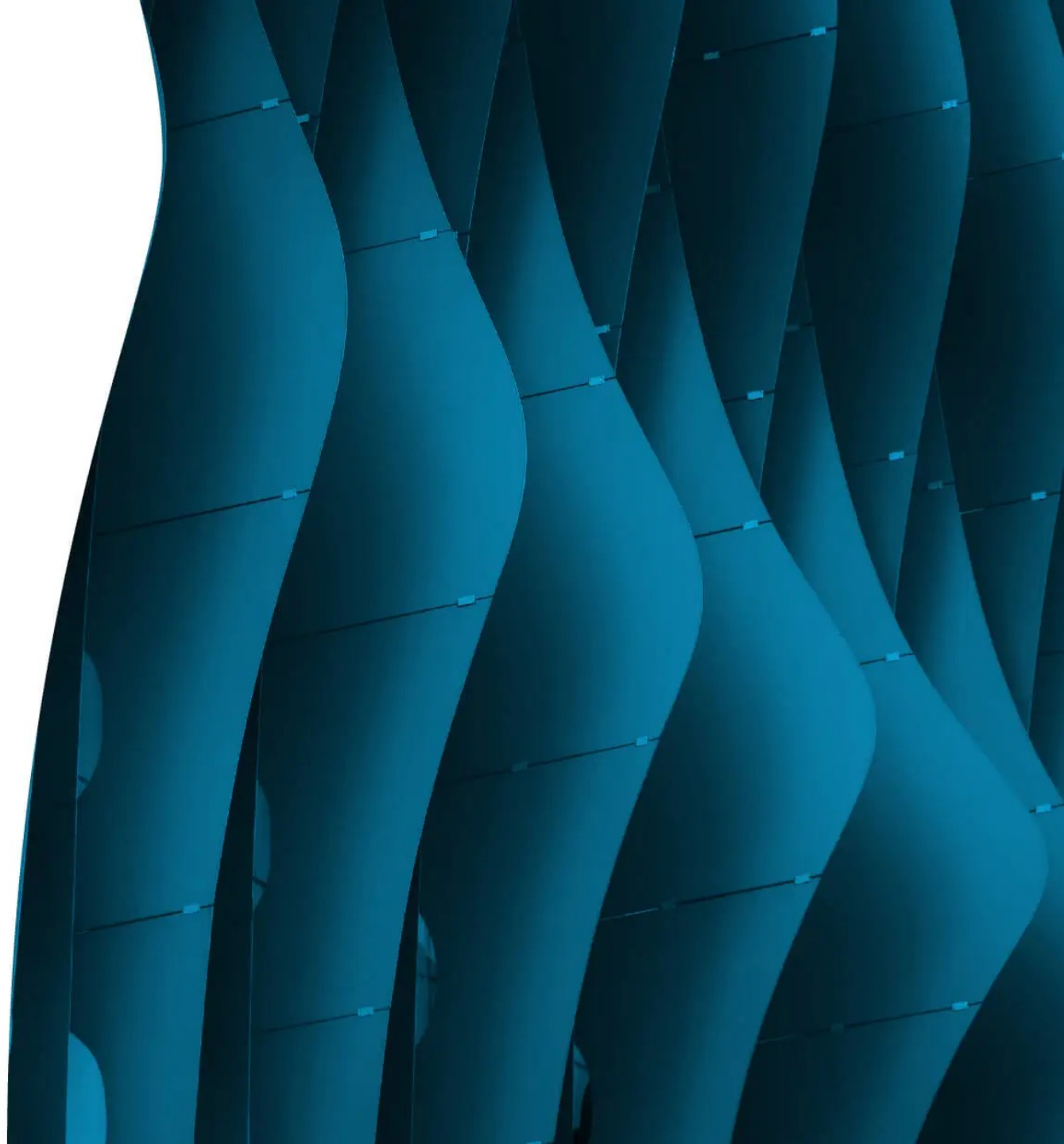
About Tailwind

Tailwind is an impact venture fund and ecosystem builder focused on accelerating the development and deployment of adaptation and resilience solutions.

Activities

- Investments in early stage, mission-driven adaptation & resilience startups
- Thought-leadership and convenings for government, funders and industry leaders
- Innovation programs and technical assistance for innovators, investors, corporates and governments



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A Taxonomy for Adaptation & Resilience

- Climate Adaptation and Resilience (A&R) is rising on the agenda of policymakers, private investors, and philanthropic donors. However, tracking and classifying activities, products and services related to A&R is challenging due to the lack of a fit-for-purpose, consensus taxonomy.
- This deck presents Tailwind's sector-based taxonomy to organize and track activities and financing across sectors. By outlining this starting point for a common language across a range of A&R activities and investor types, we aim to increase alignment and, ultimately, investment. We anticipate this taxonomy will continue to evolve over time.
- This taxonomy was developed with funding and support from ClimateWorks Foundation, and peer-reviewed by a broad group of investors and philanthropies for usability and completeness. Key partners in this effort include the Global Adaptation and Resilience Investor group (GARI)'s Climate Resilience Investment in Solutions Principles, the Climate Bonds Initiative's Resilience Taxonomy, the Climate Policy Institute's adaptation and Resilience Finance practice, and Vibrant Data Labs' Climate Finance Tracker.
- Several partner organizations work on related initiatives intended to help scaffold the growing adaptation and resilience market – including investment guidance, finance tracking, and investment eligibility criteria. We coordinated closely with these partners to ensure the coherence and interoperability of our respective efforts. While the use cases and final products may be different, users will find a consistent sector breakdown across these initiatives, which will help investors and funders navigate the market and identify areas to deploy capital.
- We extend our warmest thanks to the many partners and reviewers who contributed their time and expertise to this project. Any error or omission is our sole responsibility. Feedback and questions are welcome: info@tailwindclimate.com

Definitions: Adaptation & Resilience (A&R)

The terms climate change adaptation and climate resilience are sometimes used interchangeably. Although there is overlap in how the terms are used, one may not necessarily substitute for the other. (Source: IPCC AR6)

- **Climate change adaptation** is the process of human and natural systems adjusting to the actual or expected impacts or effects of climate change. It includes adapting to short-term weather fluctuations, inter-annual variability, and longer-term changes over decades, and it relates to adjustments in behaviors, practices, skill sets, natural processes, and knowledge that anticipate short-, medium-, and long-term changes.

- **Resilience** is the ability of a human or natural system to withstand the impacts of exogenous shocks and to cope with or rebound from them. The term encompasses the capacity of a system to face multiple shocks and stressors-socioeconomic, market related, climate related-and withstand them.

- **Climate resilience** is strengthening a system to withstand climate-related shocks or stressors where adaptation and resilience intersect. It constitutes an important and growing subset of building system-level resilience to multiple shocks. Climate resilience

is the capacity of a system to cope with, or recover from, those effects, while retaining the essential components of the original system.

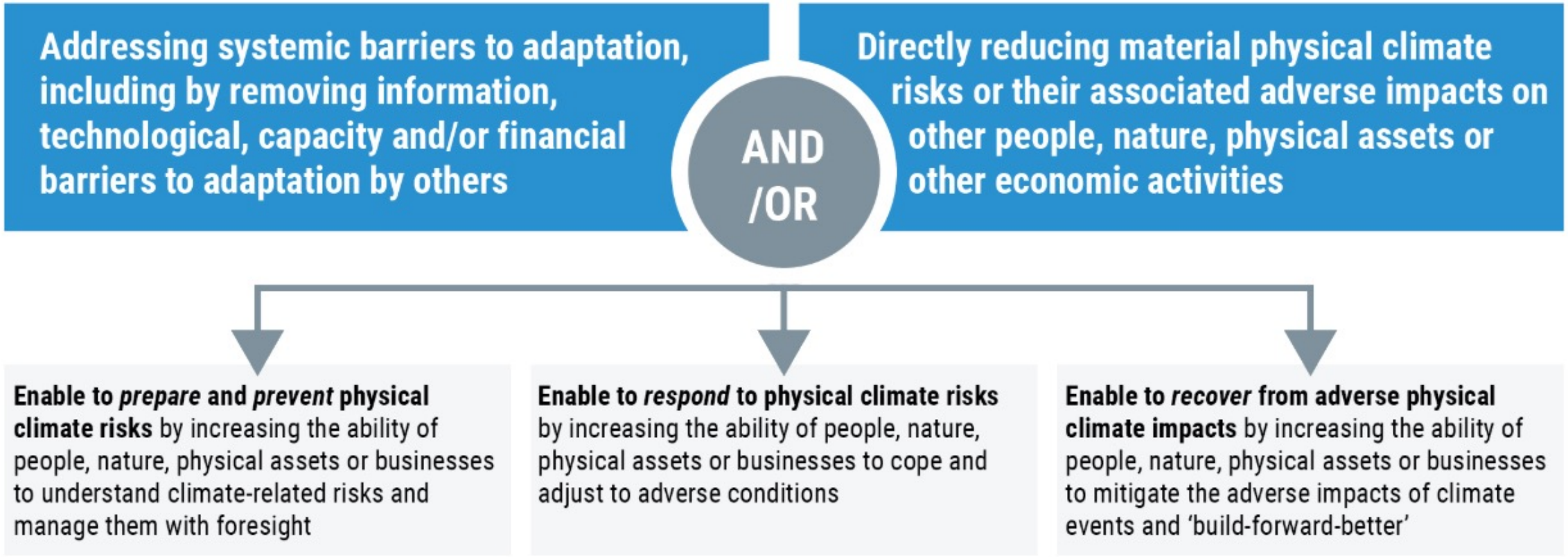
- **Maladaptation** is related to actions that may lead to increased risk of adverse climate-related outcomes, including through increased GHG emissions, increased vulnerability to climate change, or diminished welfare, now or in the future. Maladaptation is usually an unintended consequence.

For the purposes of this taxonomy and document, **activities and investments committed to advancing climate change adaptation and building climate resilience are referred to as 'Adaptation and Resilience' (A&R).**

Note that international finance organizations and multilateral development banks use 'Adaptation Finance' to include both adaptation and resilience funding.

Definitions: A&R Activities

We define an Adaptation and Resilience Activity as a **solution** (product or service) or **enabling intervention** that *prepares*, *prevents*, *responds* to and/or *enables recovery* from climate shocks and stresses by:



Source: GARI Climate Resilience Investment in Solutions Principles (March 2024) - https://tinyurl.com/2x4nkjuv

Assessment Criteria of A&R Activities

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- While the taxonomy includes a wide range of sectors that may need adaptation and resilience solutions or interventions, not every activity in these sectors advances A&R goals – far from that. Users should use Assessment Criteria to determine whether an activity does, in fact, advance A&R outcomes, or is just business-as-usual.
- We include below an example of Assessment Criteria developed by the Global Adaptation and Resilience Investment group (GARI) for reference. Other assessment criteria that may be used include those developed by the Climate Bonds Initiative, as well as the criteria laid out by the EU Green Taxonomy, to name just a few.

Steps	Guidance
Step 1: Assess the Activity	Determine whether an activity: • Prevents or reduces physical climate risks or their associated adverse impacts on people, nature, assets, or other economic activities and/or • Addresses systemic barriers to adaptation by removing information, technological, capacity and/or financial barriers to adaptation by others
Step 2: Evaluate for Maladaptation and Do No Significant Harm*	Evaluate the intervention to ensure that it does not: • Present maladaptation risks including risks to the Paris 1.5 goal • Present risks to social, environmental, or economic systems • Contain risks that could prevent the realization of desired impact
Step 3: Measure Results	• Assess the positive impacts already achieved by A&R intervention (if available given the stage of a company's maturity) • Determine expected impacts over the life of the intervention • Measure and monitor A&R impacts over the life of the intervention

*Do No Significant Harm: Developed by the EU, the principle of do no harm is a criteria meant to exclude investments that have negative consequences on people or the environment. Refer to list of potential maladaptive outcomes on slide17.

Source: Adapted from Climate Resilience Investments in Solutions Principles (CRISP) from GARI (March 2024), with slight alterations from the authors. https://tinyurl.com/2x4nkjuv

Target Audience and Use Cases

- **This taxonomy is a classification and exploration tool:**
  - It should be used in tandem with assessment criteria to determine whether individual projects or investments are, in fact, adaptation. We provide guidance to this effect in the deck.
- **The intended audience(s) of this taxonomy include:**
  - Investors, Donors and Researchers looking to classify projects, activities, solutions or companies in a structured, consistent set of themes and sub-themes of relevance to adaptation and resilience.
  - Investors and Donors looking to identify whether an existing or new project, company or product could have adaptation and resilience benefits.
  - Anyone curious about climate adaptation and resilience, looking to understand how climate change may impact different economic sectors, ecosystems, or social activities and explore examples of technologies, products, services, financial and insurance products or enabling interventions that may help mitigate these impacts.
- **What this taxonomy is not:**
  - It is NOT a white-list of solutions or activities that are *always* beneficial for adaptation and resilience. Adaptation is almost always location- and context- dependent. Some technologies and solutions listed as examples may in fact lead to maladaptation if used inadequately, at the wrong place or time.
  - It is NOT it an exhaustive and final list of 'qualifying' A&R activities. It contains examples intended to help the reader broaden their horizon as to the breadth of interventions required to enhance adaptation and resilience globally, but the examples are neither exhaustive nor exclusive.

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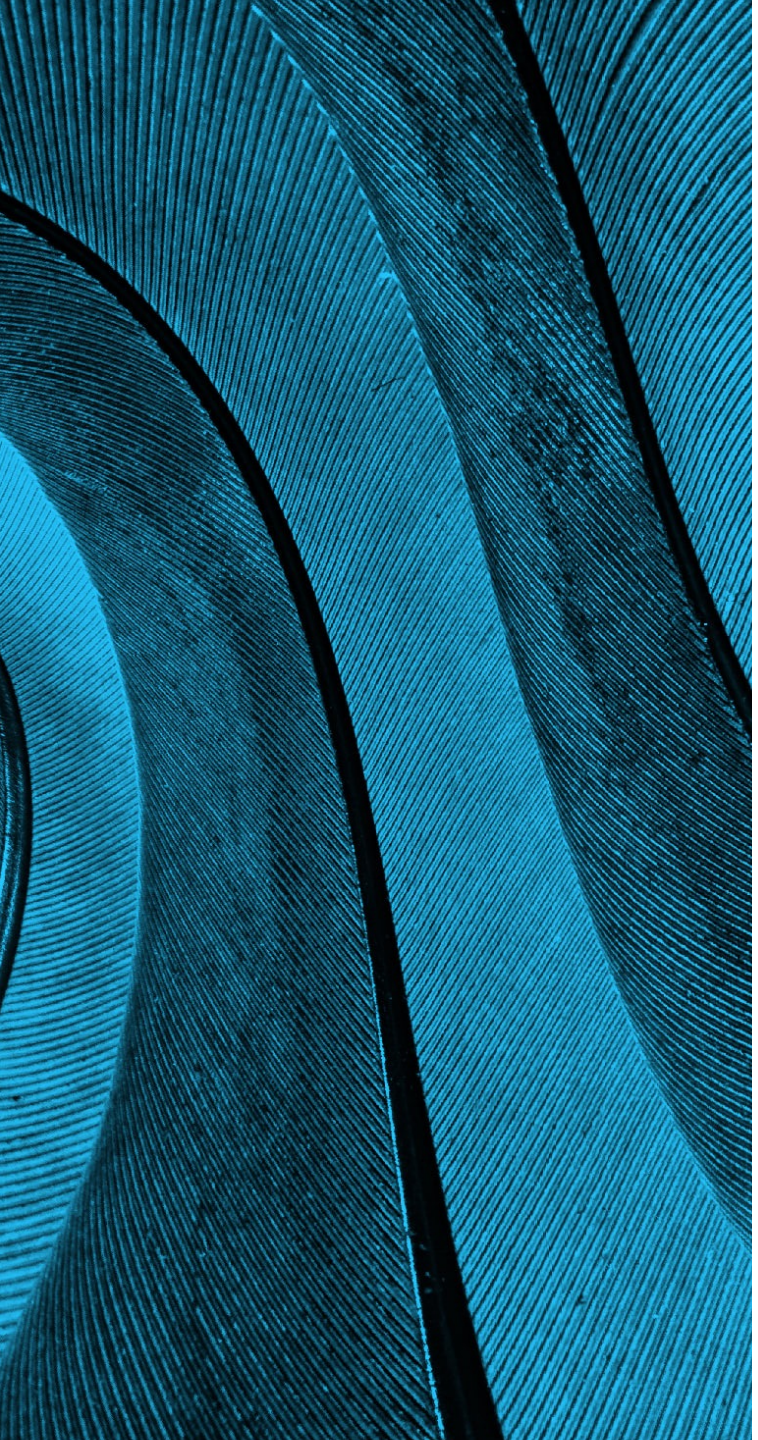
Methods

The Adaptation and Resilience Taxonomy was created through the following process:

- **Desktop Research**: Our team reviewed scientific literature, policy and investment frameworks and taxonomies both published and under development, as well as sector-specific technical reports to create this product. Key public taxonomies reviewed in the course of this taxonomy's development include; the UN's SDGs, the Global Goal on Adaptation, the IPCC's AR6, Climate Bonds Initiative's Resilience Taxonomy White Paper.
    - See full bibliography in the Taxonomy Spreadsheet.
- **Expert Interviews and Stakeholder Feedback**: Our team interviewed over 40 individuals from 35 organizations working as funders and practitioners in this space. These interviews included conversations with visionary funders, philanthropies, and early-stage investors with experience deploying capital into adaptation and resilience work.
- **Partner Collaboration**: We worked with a few key partners to ensure this taxonomy reflected emerging best practices in this field. Those partners include; Climate Policy Initiative, Climate Bonds Initiative, Vibrant Data Labs, and the Global Adaptation and Resilience Investment Group (GARI).
- **Taxonomy Development**: We consolidated information from desktop research, partner calls, and stakeholder interviews into the taxonomy spreadsheet and into this presentation.



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Use Cases

Investors and Funders

This taxonomy provides examples of investment opportunities across asset classes, financial instruments, and sectors. Investors and funders will find examples of investment opportunities that include, among others:

- Infrastructure/ project finance
- VC/PE
- Bonds and public equities
- Blended finance and other innovative instruments
- Grants and philanthropic investments

Researchers

This taxonomy may be used to categorize existing companies, products and services, or philanthropic grants. It provides a common platform to track adaptation finance across sectors, and is used to inform, among others:

- Tracking private investments in A&R startups
- Tracking global climate finance flows (public and private)

Taxonomy Structure

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Themes & Sectors

- Breakdown of 8 Themes and 35 Sector critical to A&R
- Definitions of what is included in each Theme and Sector
- Adaptation Goal at the theme- or sector-level

Impacts

- Description of projected physical impacts of climate change in each Sector

Who and what is affected?

Illustrative list of:

- Key stakeholders
- Physical Assets
- Natural Assets

Examples of A&R Activities*

- Intelligence
- Products & Services
- Finance & Insurance
- Enabling Interventions

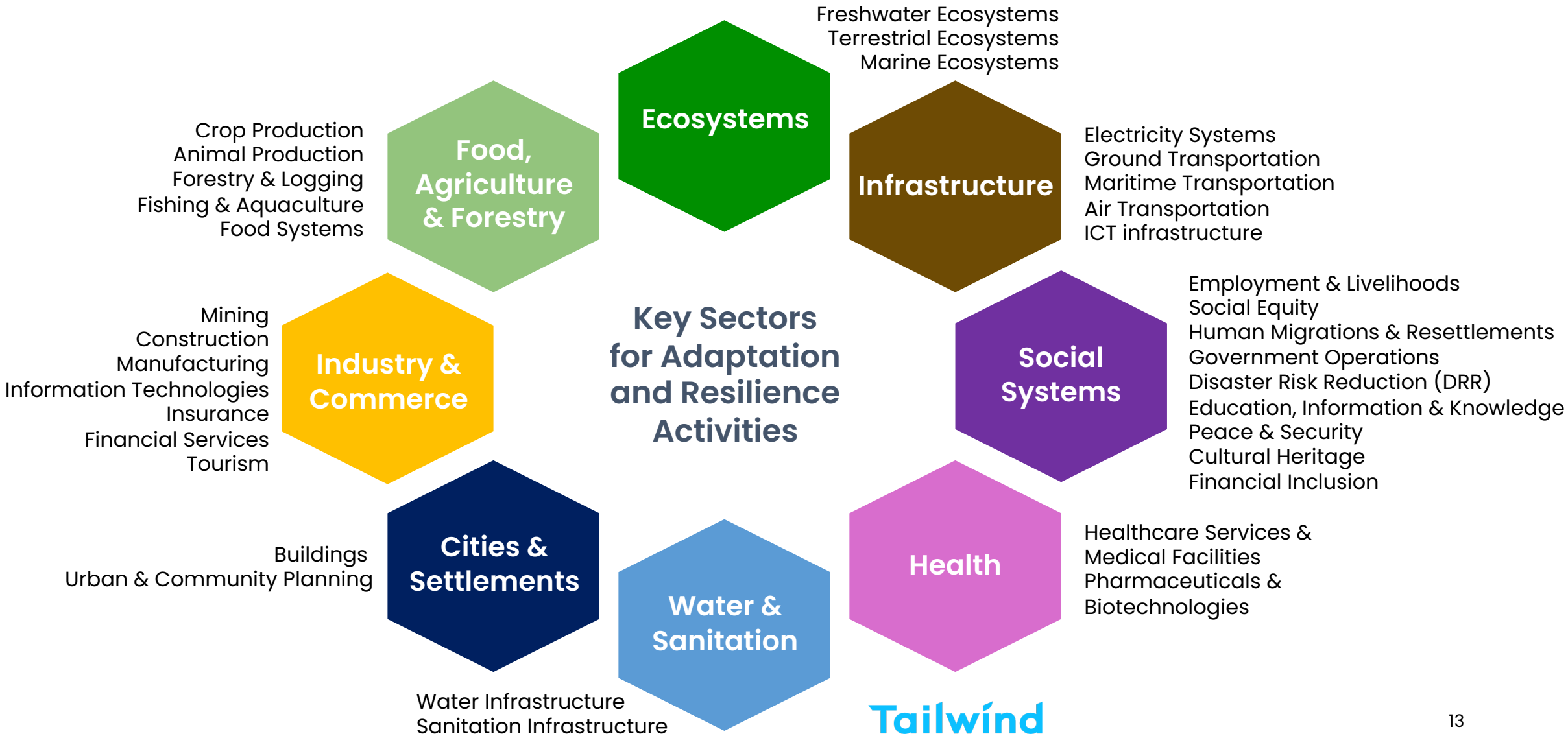
See below for definitions of each type of activity

Each Sector in the Taxonomy is mapped to widely-used financial, economic and impact taxonomies, including:

- GICS
- NAICS
- OEC DAC Markers
- Sharm El Sheikh
- Sustainable Development Goals (SDGs)

Taxonomy Themes and Sectors

8 Themes, 35 Sectors



Alignment with the Global Goal on Adaptation & SDGs

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Theme	Global Goal on Adaptation Framework (COP28: CMA5, art. 9)	Alignment with SDGs
Ecosystems	(d) Reducing climate impacts on ecosystems and biodiversity, and accelerating the use of ecosystem-based adaptation and nature-based solutions, including through their management, enhancement, restoration and conservation and the protection of terrestrial, inland water, mountain, marine and coastal ecosystems;	
Food, Agriculture & Forestry	(b) Attaining climate-resilient food and agricultural production and supply and distribution of food, as well as increasing sustainable and regenerative production and equitable access to adequate food and nutrition for all;	
Water & Sanitation	(a) Significantly reducing climate-induced water scarcity and enhancing climate resilience to water-related hazards towards a climate-resilient water supply, climate-resilient sanitation and towards access to safe and affordable potable water for all;	
Health	(c) Attaining resilience against climate change related health impacts, promoting climate-resilient health services, and significantly reducing climate-related morbidity and mortality, particularly in the most vulnerable communities;	
Social Systems	(f) Substantially reducing the adverse effects of climate change on poverty eradication and livelihoods, in particular by promoting the use of adaptive social protection measures for all; (g) Protecting cultural heritage from the impacts of climate-related risks by developing adaptive strategies for preserving cultural practices and heritage sites and by designing climate-resilient infrastructure, guided by traditional knowledge, Indigenous Peoples' knowledge and local knowledge systems;	
Cities & Settlements	(e) Increasing the resilience of infrastructure and human settlements to climate change impacts to ensure basic and continuous essential services for all, and minimizing climate-related impacts on infrastructure and human settlements;	
Infrastructure		
Industry & Commerce	Not included in GGA. We borrow language from the Climate Bonds Initiative/UNDRR white paper: "ensur[ing] that industrial and commercial operations are resilient to the projected and future impacts of climate change so that their economic output, operational safety, affordability of products and services and the provision of employment are not adversely affected by such impacts"	

Definitions

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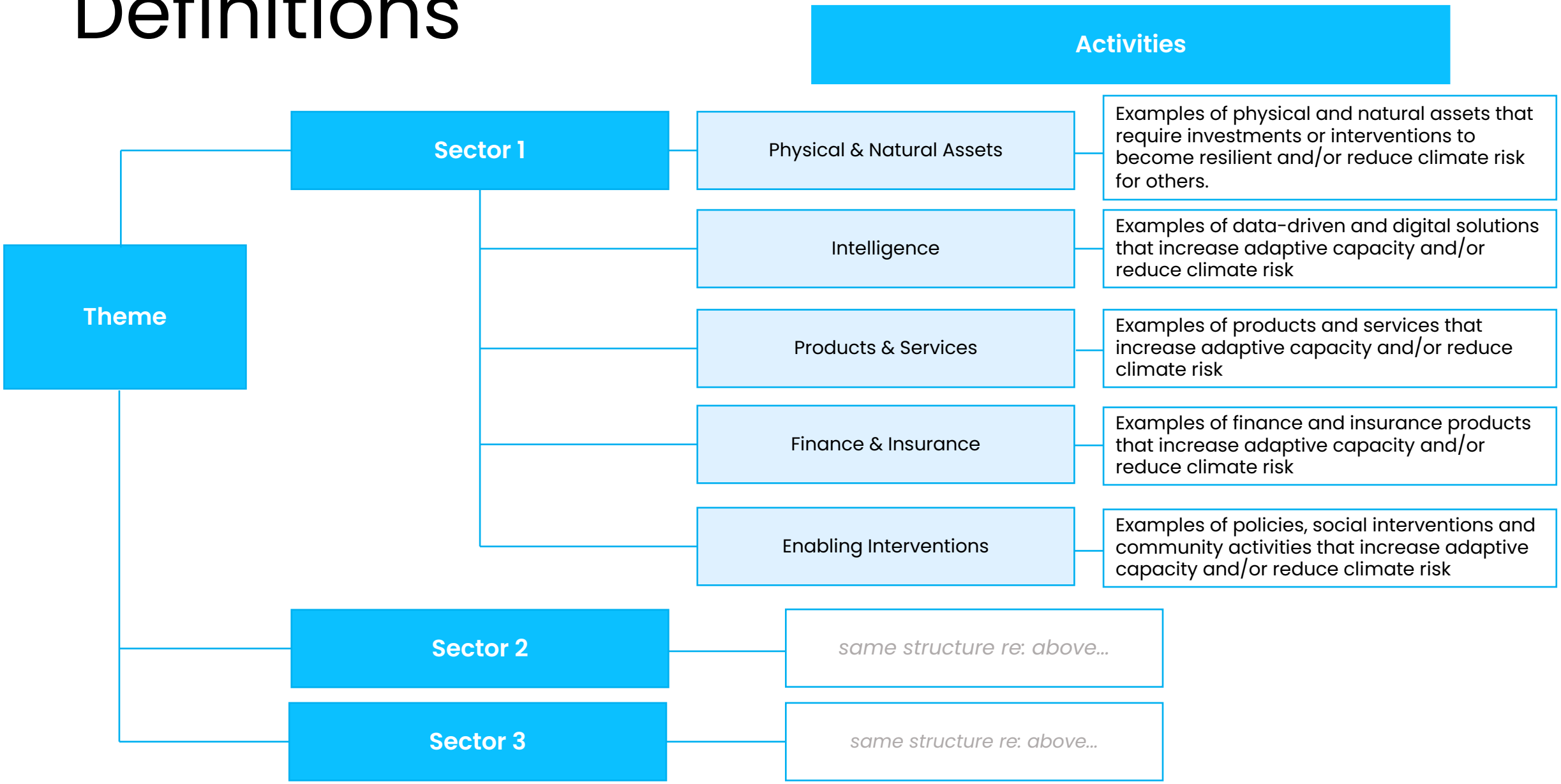

Cross-cutting Factors: Illustrative List

The following cross-cutting factors are critical to consider and not yet fully incorporated into the taxonomy. More work is needed to provide assessment criteria and ensure their thoughtful integration into all relevant activities, investments and interventions.

- **Socio-Economic Development Level:** Investments in adaptation have radically different costs, implementation barriers and impacts depending on the socio-economic situation of the target community or locale. Solutions should be developed with the specific needs and limitations of communities front of mind.
- **Gender Lens** – Studies show the link between solutions and interventions that advance gender equity and those that advance climate goals. Women and girls should be a priority group in the development of climate adaptation and resilience solutions.
- **Social Justice** – Those with less resources experience climate impacts with increased severity. Solutions and investment plans should prioritize solutions and interventions that drive economic equality and equity so that the adaptive capacity of those with less resources can be improved.
- **Local Context and Knowledge** – Climate change's impacts are experienced locally, and these impacts vary across communities. It is critical that solution providers and those investing in climate adaptation and resilience solutions solicit knowledge from the people experiencing climate impacts and tailor the activities to local conditions to ensure the impact they seek can be achieved.
- **Indigenous Groups** – Indigenous communities have developed many strategies and approaches that advance climate adaptation and resilience. Indigenous communities and groups be involved in the development and deployment of new solutions to ensure the solutions they have created and long championed are part of wholistic approaches to driving adaptation and resilience impact.

Key Considerations: Maladaptation

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Maladaptation

Maladaptation is defined by the IPCC AR6 as any changes in natural or human systems that inadvertently increase vulnerability to climatic stimuli; an adaptation that does not succeed in reducing vulnerability but increases it instead.

Maladaptation is defined by the presence of activities that:

(1) increase social vulnerability or cause unintended harm to humans,

(2) increase climate-related impacts on ecosystems or ecosystem services,

(3) worsen the present or future condition of marginalized groups like low-income households, ethnic minorities, and women,

(4) inhibit deep and systemic change, or

(5) cause additional GHG emissions.

Maladaptation is usually an unintended consequence and can simply be activities that "lock in" the status quo.

Do No Significant Harm (DNSH)

The DNSH principle entails assessing whether an investment in an economic activity that contributes substantially to an environmental or social objective does not significantly harm any environmental or social objectives*. Significant Harm is defined in the EU Taxonomy (source) as activities that inhibit:

(1) climate change mitigation,

(2) climate change adaptation,

(3) sustainable use and protection of water and marine resources,

(4) the transition to a circular economy,

(5) pollution prevention and control, or

(6) the protection and restoration of biodiversity and ecosystems.

**EU social objectives* *include; combatting social exclusion and discrimination, promoting social justice and protection, ensuring equality between women and men, and protecting the rights of children.*

Measuring Impact: Resources and Open Questions

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- Selecting appropriate impact metrics for adaptation interventions can be challenging. Unlike carbon mitigation, there is no single, universal metric. Rather, adaptation and resilience is about protecting human lives, quality of life, infrastructure and economy assets, among others.
    - For a longer discussion of A&R monitoring and evaluation challenges, see: Why this is hard: 12 reasons why climate change adaptation M&E is challenging, UKCIP 2014.
- We encourage users to determine what combination of indicators will best capture impact for the specific solutions being considered. User may consider the following elements when developing impact metrics
    - Who benefits from the intervention? Who is protected when a system becomes more resilient?
    - How much benefits does the intervention provide? E.g. Longevity, durability, uptime, effectiveness.
    - When will benefits manifest over time? Who benefits first / last?
    - Who has / does not have access?
- Existing performance or impact metrics can often provide a useful starting point to the extent that the intervention is looking to minimize disruption or prevent negative outcomes.

The following resources may help assess and determine best fit indicators:

- The Framework and Principles for Climate Resilience Metrics in Financing Operations, published by multilateral development banks in 2019.
- The Adaptation M&E Navigator: A Decision Support Tool for the Selection of Suitable Approaches to Monitor and Evaluate Adaptation to Climate Change
- The Prototype Climate Adaptation and Resilience Impact Metrics developed by the Global Impact Investor Network (GIIN) in the IRIS framework (Dec 2023)
- UNEP FI Adaptation and Resilience Investor Collaborative's Adaptation & Resilience Impact: A measurement framework for investors (April 2024)
- The Sendai Framework Indicators developed to measure progress against the implementation of the Sendai Framework for Disaster Risk Reduction

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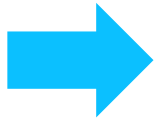
Mapping & Tracking A&R Financial Flows

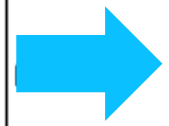
Curated Examples

Mapping Financial Flows: Philanthropic Grants

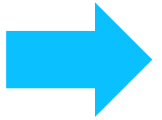
Bill & Melinda Gates Foundation	Centro Internacional de Mejoramiento de Maiz y Trigo	to accelerate the development and delivery of more productive, climate-resilient, market-demanded, and nutritious maize and wheat varieties in support of sustainable agricultural transformation in Sub-Saharan Africa and South Asia
Kresge Foundation	Michigan Community Health Worker Alliance (MiCHWA)	This grant will enable the Michigan Community Health Worker Alliance (MiCHWA) to design, distribute and evaluate a curriculum for community health workers focused on the health effects of climate change. The curriculum, which will be distributed nationally, will prepare community health workers to both identify locally specific climate health threats as well as to engage with a range of partners to pursue solutions.
Barr Foundation	Vietnamese-American Initiative for Development	To engage residents of Fields Corner and surrounding neighborhoods to develop climate resilient strategies.



Theme: Agriculture, Food & Forestry
Sector: Crop Production
Activity: Enabling Intervention



Theme: Health
Sector: Healthcare, Hospitals & Medical Facilities
Activity: Enabling Intervention



Theme: Cities & Settlements
Sector: Urban & Community Planning
Activity: Enabling Intervention

Note: many A&R activities touch on multiple sectors. We recommend assigning the activity (company, solution, project) to the sector where it will have the greatest impact. User may also wish to add a secondary sector, and/or to add tags to note whether the project has co-benefits (e.g. gender lens or equity focus)

Mapping Financial Flows: Startups

Sonic Fire Tech's patented acoustic wave suppression system uses silent infrasound waves to suppress wood and chemical fires at up to 10 meters.

Our products provide a unique uninterruptible solution that is safe, ecologically friendly, and spares assets from unnecessary damage or mess.

Our tech can be attached to drones to aid in the ultra-early wildfire suppression effort or built into high-value assets such as data centers or aerospace facilities where legacy fire suppression solutions aren't practical.

Source: sonicfiretech.com

Theme: Cities & Settlements
Sector: Buildings
Activity: Products & Services

ePAVE for Sustainability

Conventional paved surfaces like those in the United States can reach seasonal temperatures of 120°F to 151°F * – storing heat below the surface that is released at night as well as warming storm runoff water throughout the day.

- ePAVE is tested and proven to lower surface temperatures by 5-30 degrees
- Fights climate change effects by mitigating toxic GHG emissions
- Allows storm water runoff to flow clean and cool into local watersheds

Source: www.epavellc.com

Theme: Infrastructure
Sector: Ground Transportation
Activity: Products & services

ISeeChange empowers communities to tackle climate change impacts by integrating public input into infrastructure design and response management. Headquartered on America's Gulf Coast, we prioritize community, connection, integrity, equity, and insight.

ISeeChange has evolved into a global platform for climate data, community engagement, and education.

Residents contribute real-time observations of climate events like flooding and heat waves, which ISeeChange transforms into actionable insights using AI and sensor data. These insights enable cities, engineers, and utilities to prioritize infrastructure investments and design resilient solutions.

Source: www.iseechange.com

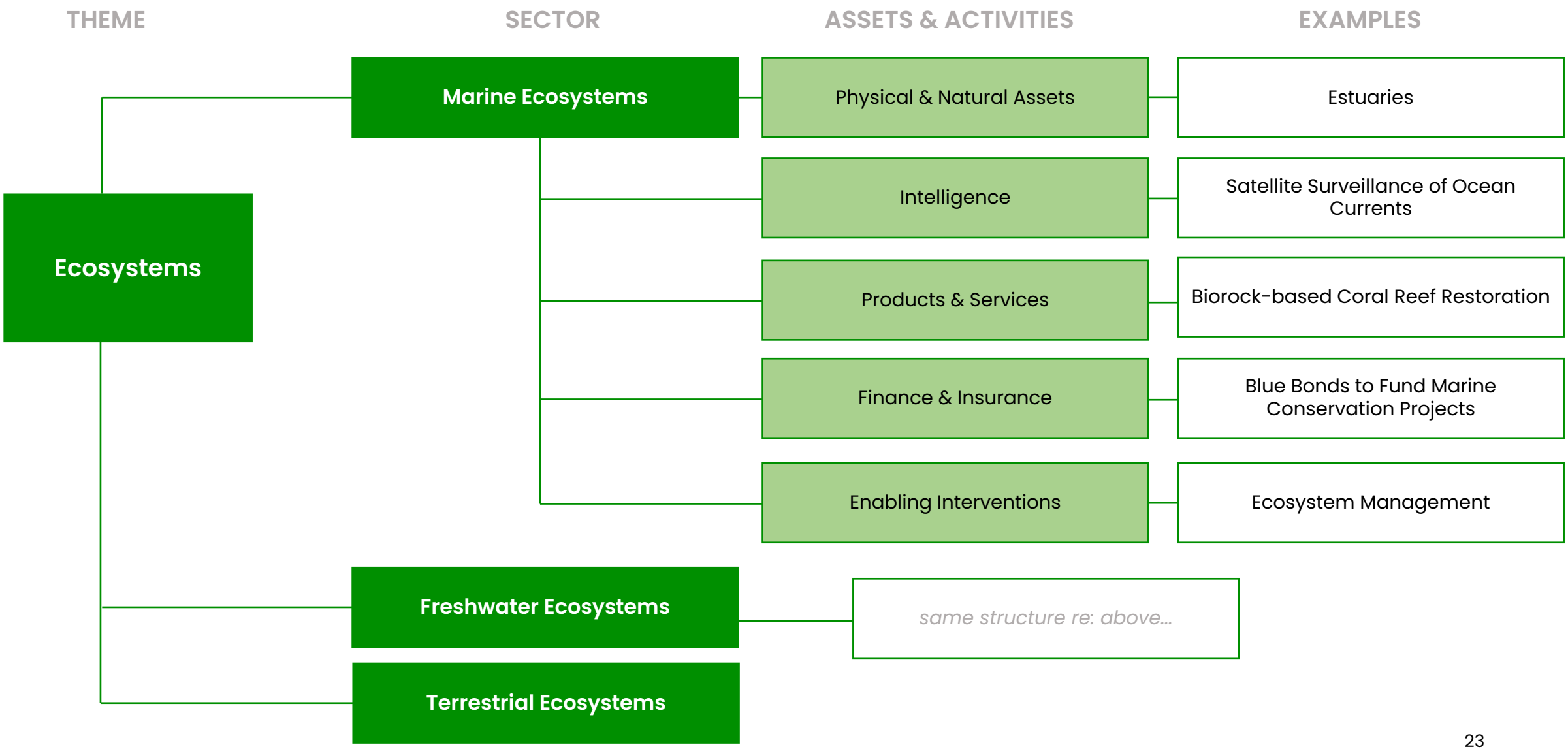
Theme: Cities & Settlements
Sector: Urban & Community Planning
Activity: Intelligence

Note: many A&R activities touch on multiple sectors. For companies, we recommend assigning the activity (company, solution) to the sector where it its primary market segment, i.e. where its technology is likely to have the greatest impact. Users may choose to add a secondary tag reflecting the industry the company is in (e.g. consumer products, materials, tech)

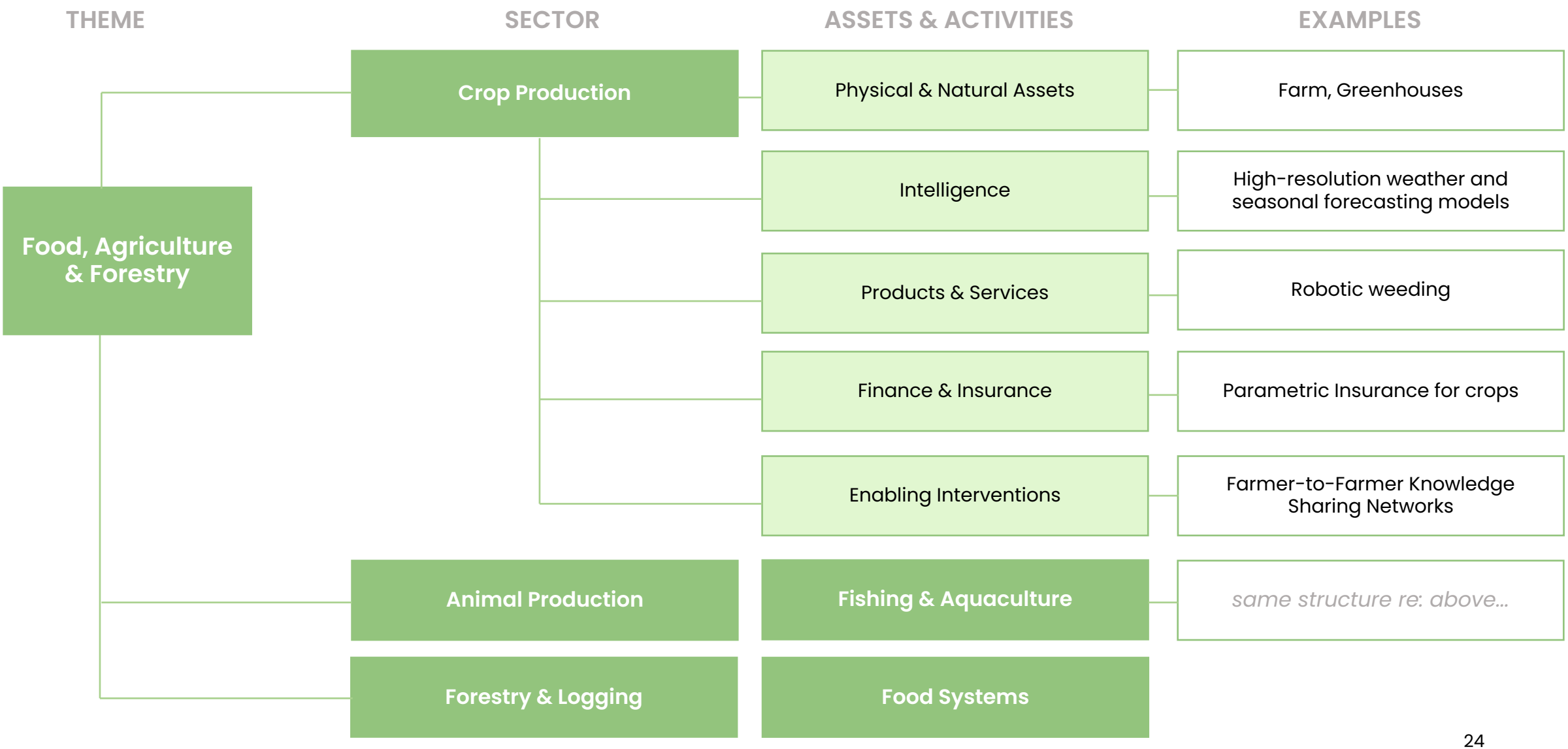
Theme & Sector Highlights

Examples of investments and enabling interventions

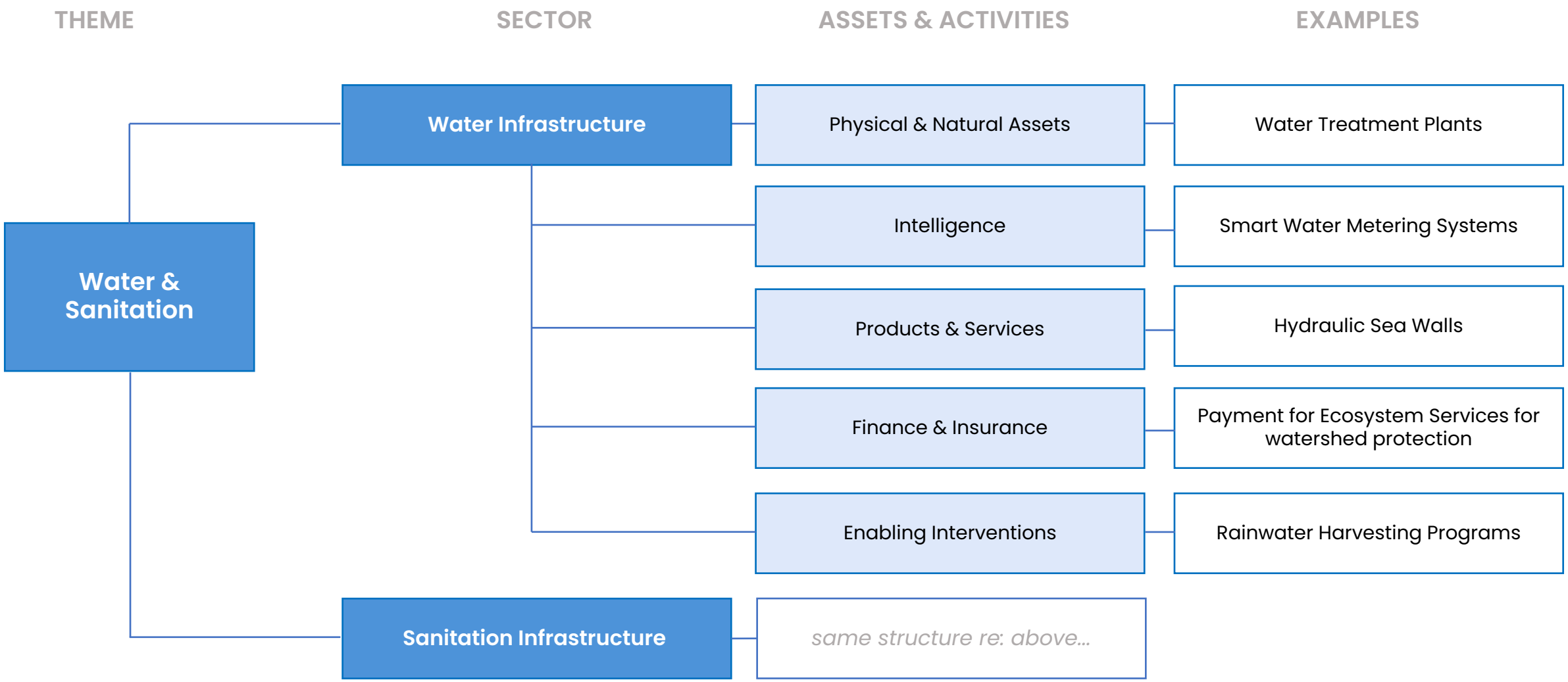
Theme Highlight: Ecosystems



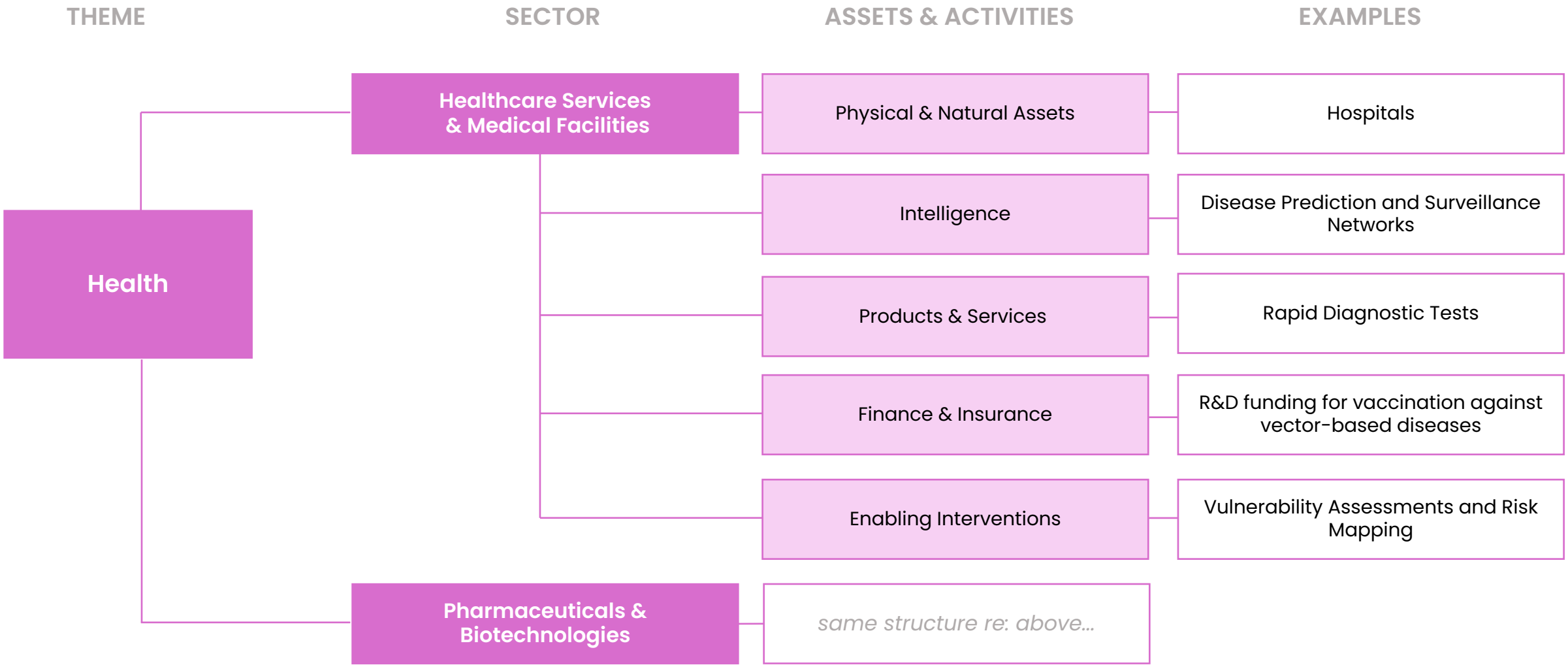
Theme Highlight: Food, Agriculture & Forestry



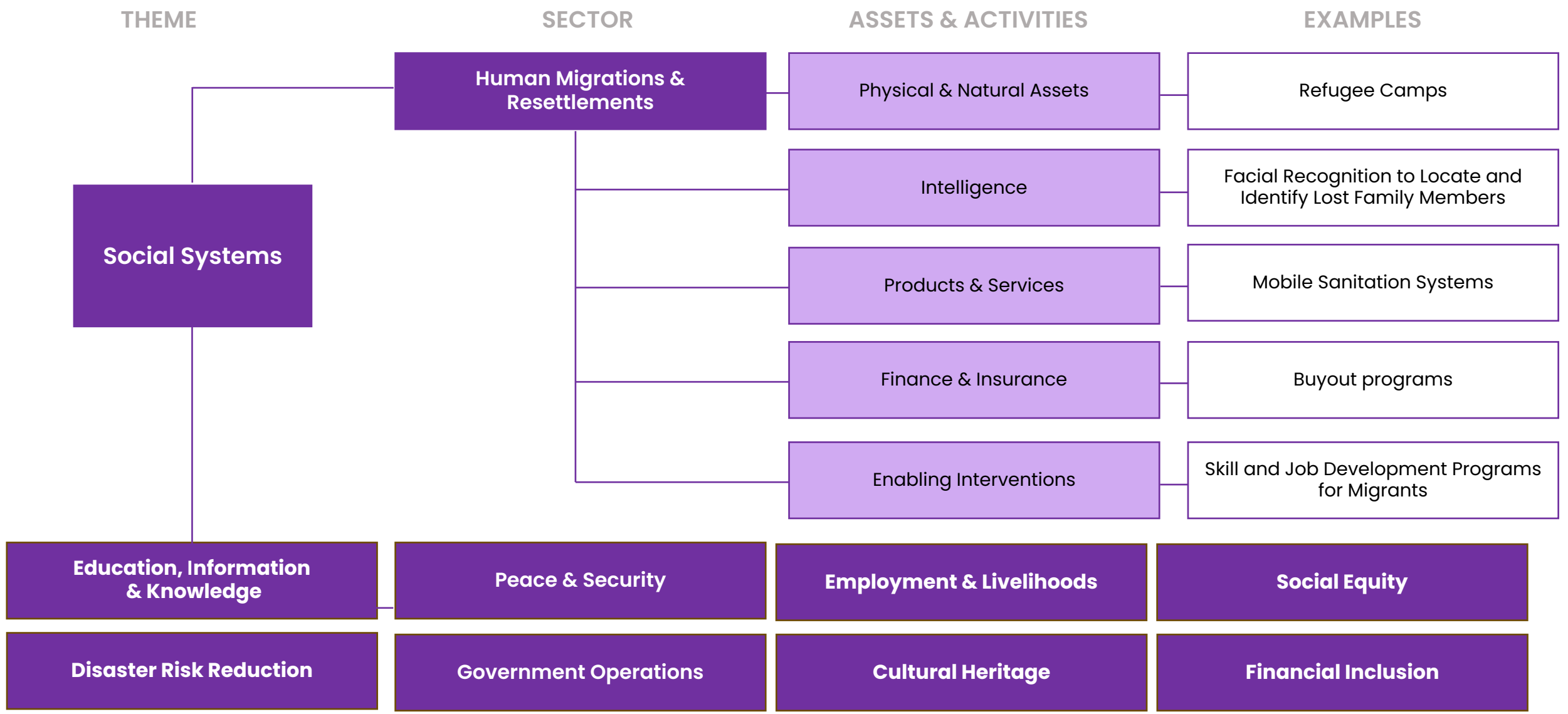
Theme Highlight: Water & Sanitation



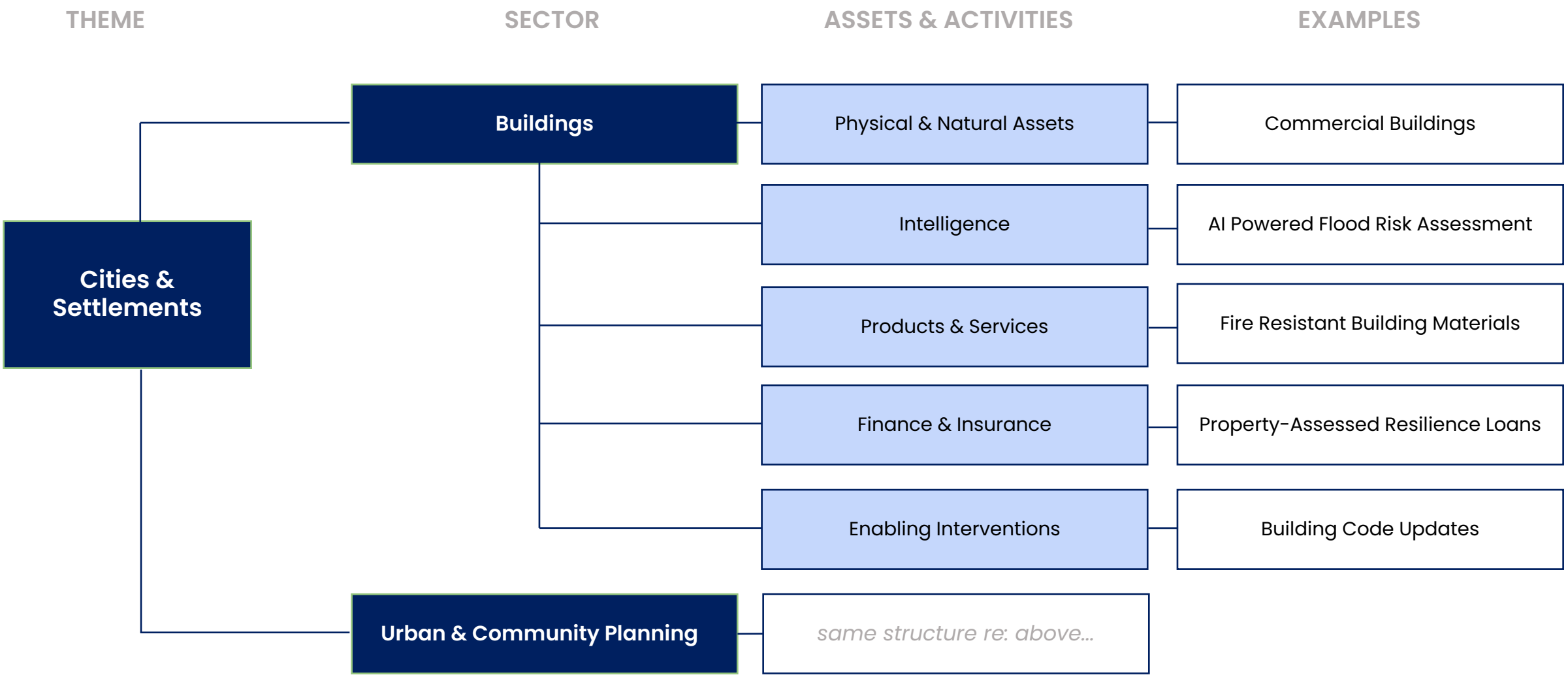
Theme Highlight: Health



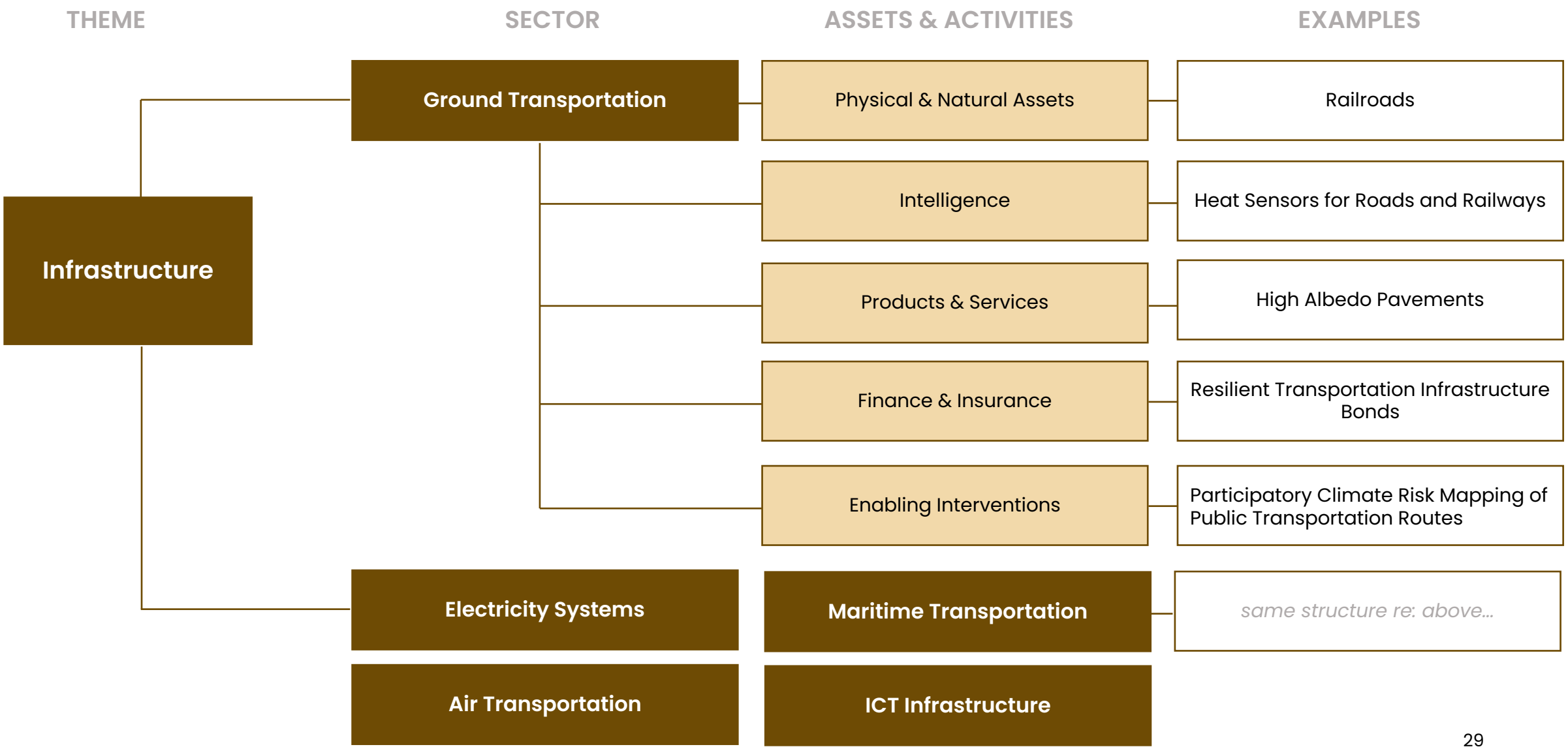
Theme Highlight: Social Systems



Theme Highlight: Cities & Settlements



Theme Highlight: Infrastructure



Theme Highlight: Industry & Commerce

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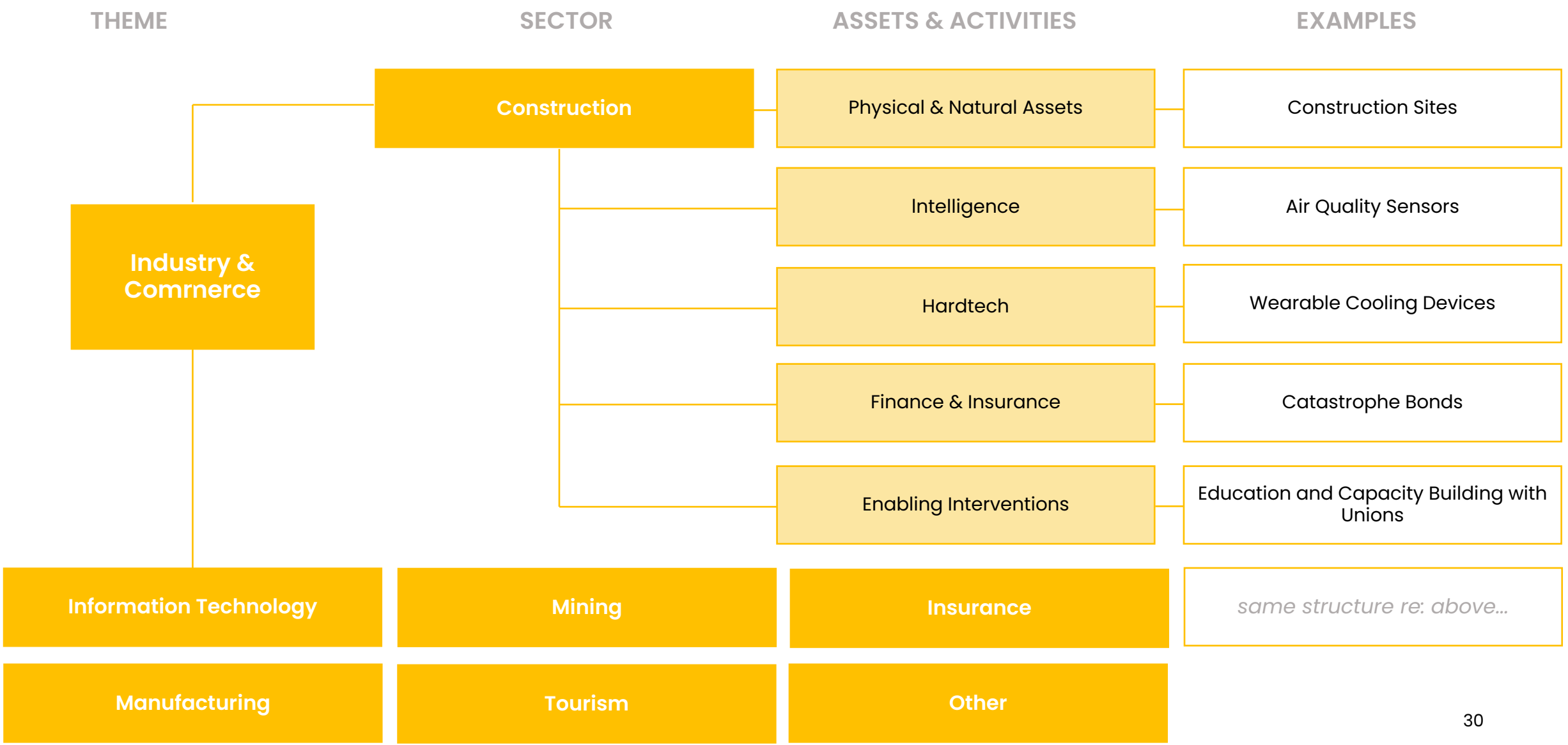

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Building a Resilient Future

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