Chapter 5: What Opportunities Exist to Support, Enhance and Amplify the Delivery of Ecosystem Services for the Economic and Social Well-being of Grenadians?

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Chapter Mandate

1. To identify opportunities and mechanisms for protecting ecosystems and ecosystem services, focusing on policy and financial instruments.
2. To explore mainstreaming economic valuation into Grenada’s existing policy and plans.
3. To examine mechanisms to amplify the delivery of ecosystem services through ecological restoration, providing guidance as to where restoration would yield the greatest value for the economic and social well-being of Grenadians.

Chapter Processes: Content Development

Follows the other Chapters by taking an **ecosystem-centred** structure (marine, agriculture, freshwater and terrestrial).

Focuses on policy, legislative, financial, economic and human resource (development, allocation etc.) **tools** for application across ecosystems.

Uses **key priorities from preceding chapters &** the stakeholder consultations, to propose strategic policy and/or other approaches.

The Problem & objective tree methodology was used to analyze key ecosystem issues and solutions.

New issues in the chapter (not identified in previous chapters or other NEA processes) are supported with **evidence** for their importance, and strategic policy and/or options are provided.

Where possible, a **suite of policy options and a measure of the team's confidence** in these, are included for each ecosystem.

Ecosystem–Level Review

Terrestrial Ecosystems: Headlines

Terrestrial ecosystem services are dynamic & interconnected

- Energy, nutrient flows link multiple systems (terrestrial, freshwater, agricultural, marine & coastal)
- Linkages demand re-think of siloed planning and decision-making

Limited land area drives intense demand for space across all economic sectors

Maintaining healthy terrestrial ecosystems, their interconnectedness & reducing conflict between sectors, requires cross-sectoral responses

- Knowledge (e.g. monitoring and evaluation of projects, interagency collaboration, valuation of terrestrial services)
- Enabling (e.g. mainstreaming biodiversity, land use, public-private partnerships, payment for ecosystem services)
- Instrumental (e.g. debt for nature, incentives and disincentives, best practice guides)

Terrestrial interventions will benefit multiple sectors

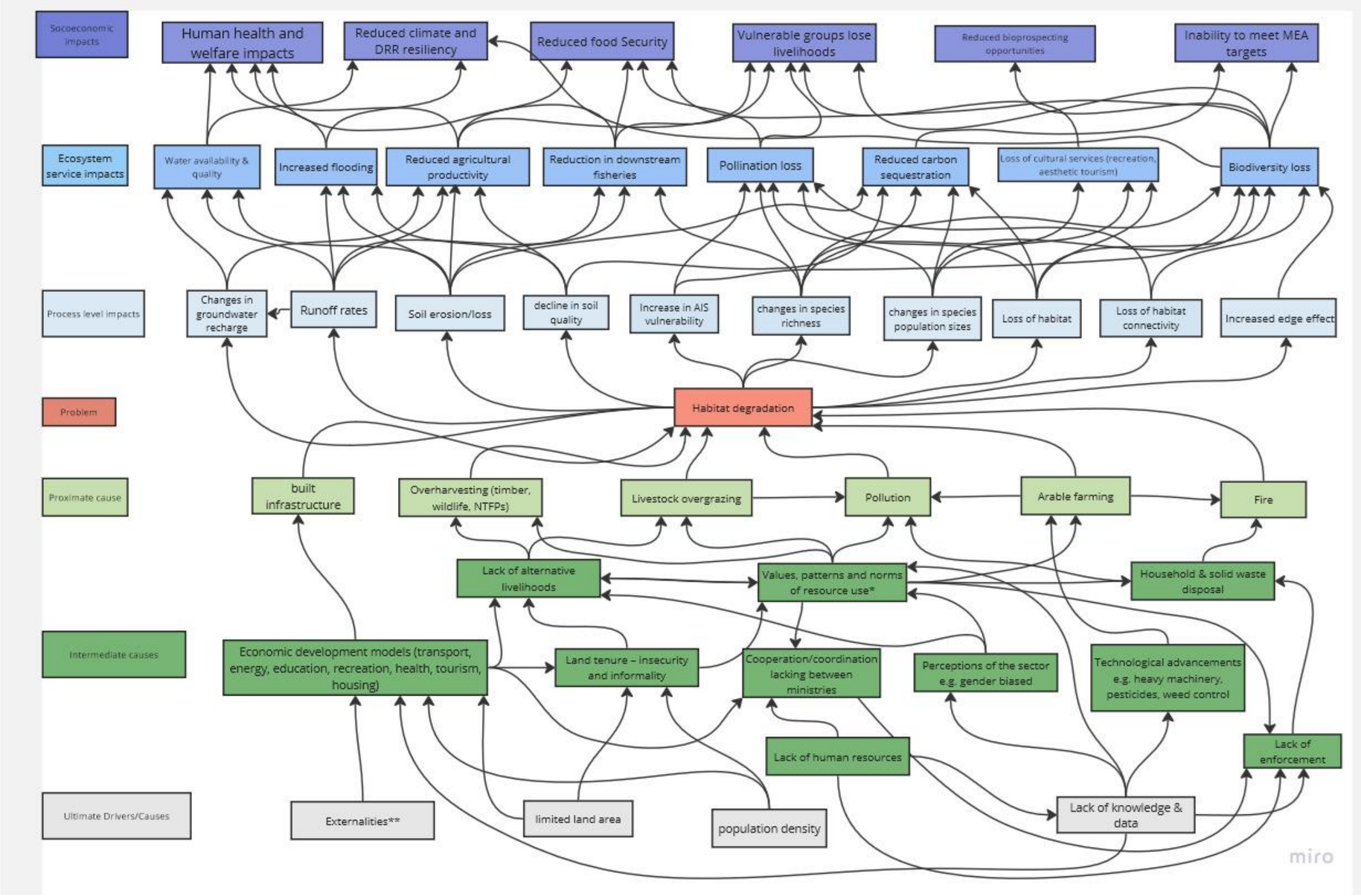
- Intact forests support downstream ecosystem services e.g. freshwater & coastal
- Resilient forests improve climate resiliency
- Intact & restored forests provide opportunities for improved livelihoods e.g. ecotourism, NTFP use & bioprospecting
- Access to green spaces improves recreation, wellbeing and public health
- Valuation of terrestrial services by all stakeholders as capital in national accounting

Terrestrial Ecosystems

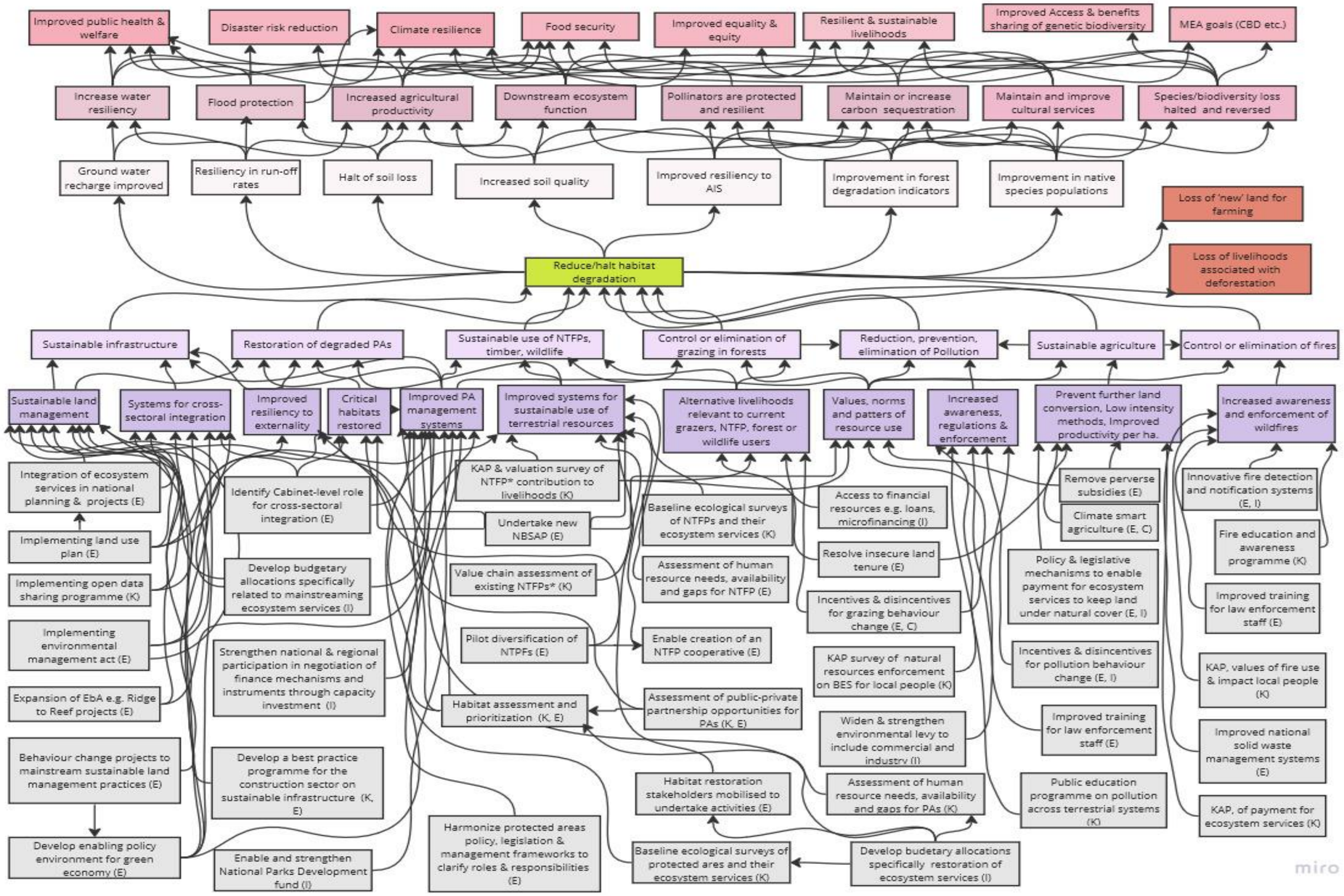
Key Threats/Issues

- Habitat degradation
- Invasive alien species
- Terrestrial overexploitation
- Pollution

Problem Tree for Habitat Degradation



Objective Tree For Habitat Degradation



Policy Areas/Recommendations for Terrestrial Ecosystems

Recommendations:

- Cabinet-level oversight for cross-sectoral integration
- Implement environmental management act and national land use plan
- Integrate ES and ES-related environmental and social safeguards in national plans and projects
- Strengthen mechanisms for public participation in decision making
- Undertake new NBSAP consistent with new Global Biodiversity Framework
- Policy & legislative mechanisms to enable payment for ecosystem services
- Enable strengthened green fund mechanism
- Harmonize protected areas policy to clarify roles & responsibilities and discourse on private protected areas
- Adopt and implement national forest policy and national protected area policy
- Promote an island-wide Sustainable Land Management approach anchored in restoration practices

Regulations:

- Enabling legislation & management frameworks to clarify roles & responsibilities for Protected Areas
- Prepare and pass revised wildlife legislation to enable CITES regulations
- Develop budgetary allocations specifically related to mainstreaming ecosystem in annual national Finance Bill
- Widen & strengthen environmental levy to include commercial and industry
- Prepare and pass enabling and strengthened National Parks Development Fund
- Remove perverse subsidies through relevant modifications to annual national Finance Bill

Agriculture Ecosystems: Headlines

Agroecosystems are highly valued for their contribution to food security, agricultural productivity and agrotourism. Protecting them are important for sustainable development.

- In 2021, agriculture was one of the largest contributors to real GDP growth at 12.5%
- Agroecosystems that are in harmony with nature and biodiversity can:
  - ❖ function as carbon sinks
  - ❖ help preserve freshwater systems through a reduction of chemical runoff
  - ❖ healthier food production
  - ❖ protect local genetic resources

Yet, governance challenges impact the sustainability of agroecosystems

- Systemic (e.g. competing land uses), Institutional (e.g. land tenure insecurity) and Resource (e.g. inadequate financing) challenges
- Far reaching implications on agroecosystem functionality, the benefits derived and how these benefits are accessed and shared

Agroecosystem functioning and the enhancement of their services for present and future generations require urgent multi-sectoral/institutional actions, which includes the involvement on non-state actors.

- Systemic Response (e.g. addressing land tenure insecurity)
- Institutional Response (e.g. emphasis on nature-positive farming in policies)
- Resource Responses (e.g. use of citizen science, making allocations within national budget for agriculture to support nature-positive farming)

Agriculture Ecosystems

Key Threats/Issues

Systemic Issues

- Competing land use issues
- Lack of legislation to enable land-related policies coupled with lack of policy enforcement

Resource Issues

- Inadequate financing and budgeting
- Inadequate data and reporting
- Underutilisation of ILK in policy and planning
- Lack of human capital

Institutional Issues

- Informality, family land and land tenure
- Institutional silos vs institutional interoperability
- Magic Bullet Solutions

Problem Tree for Agriculture System/Resource

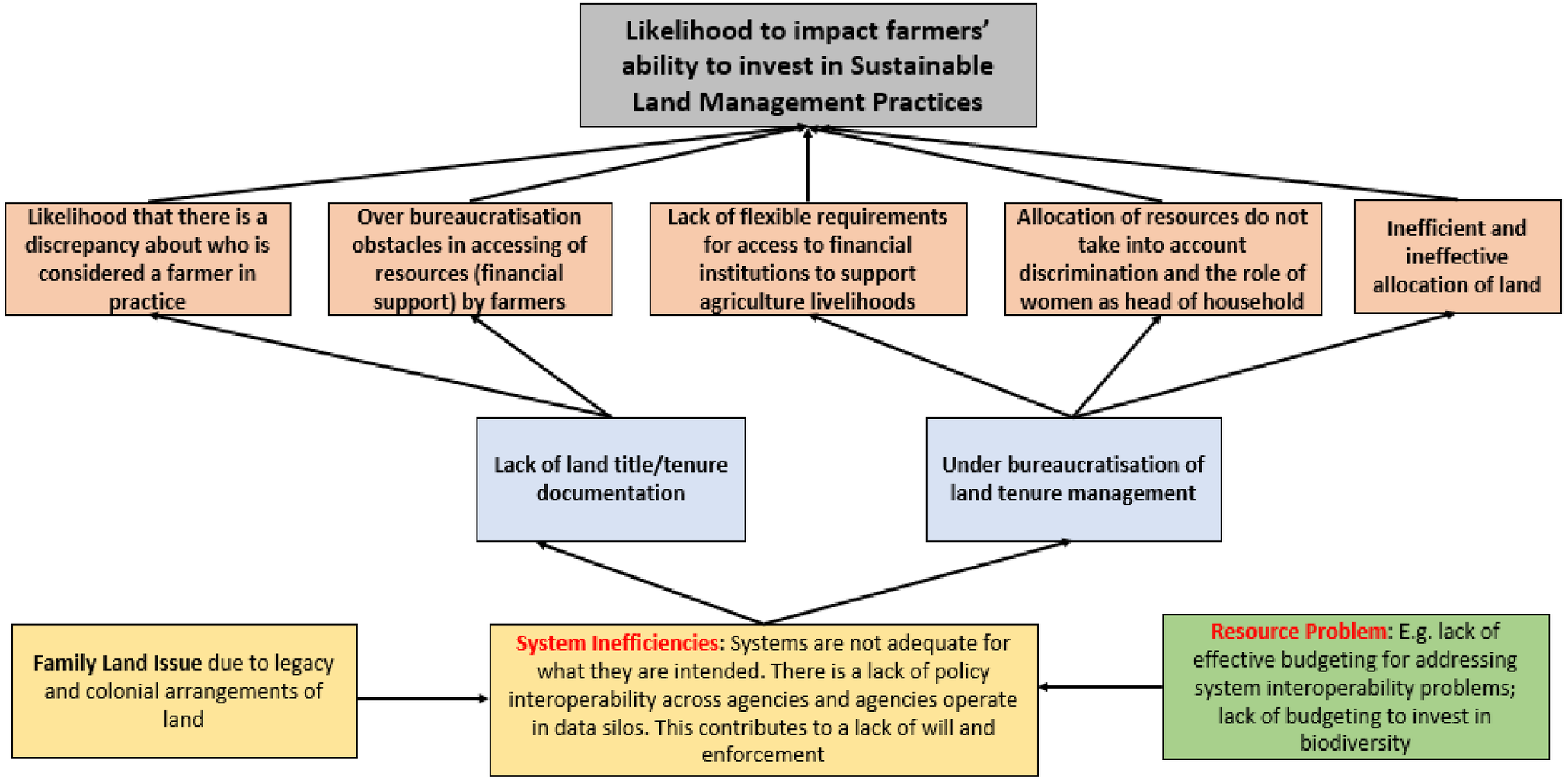


Fig. Agroecosystem Problem Tree showing how systemic, institutional and resource challenges impact the sustainable land management of agroecosystems. (*FOD version depicted. The tree will be updated to reflect main challenges in the SOD.

Policy Areas/Recommendations for Agriculture Ecosystems

Recommendations:

- Multi-sectoral/institutional approach to sustainable land management
- Addressing land tenure security
- Adaptive governance and the inclusion of non-state actors
- Emphasis on nature-positive farming in policy for both rural and urban areas
- Citizen science and adoption of ICT to address data issues
- Mainstreaming of ILK via citizen science
- Integrating restoration good practice in agricultural policy
- Public awareness and education

Regulations:

- Update and revise legislation to support and implement the national land use policy
- Allocate adequate financial resources within the agriculture budgetary allocation for biodiversity enhancement and nature-positive farming
- Use mitigation hierarchy approach to assess quota of % of ecosystems restored as % of degraded systems

Freshwater Ecosystems: Headlines

Impacts on freshwater ecosystems have far reaching implications

- Potable water availability
- Biodiversity loss
- Poor health

Common factors linked to all challenges/threats:
1) Poor governance and inadequate enforcement

- Inadequate regulations/policies to address specific issues
- Low political will to allocate necessary resources
- Lack of inspections and enforcement

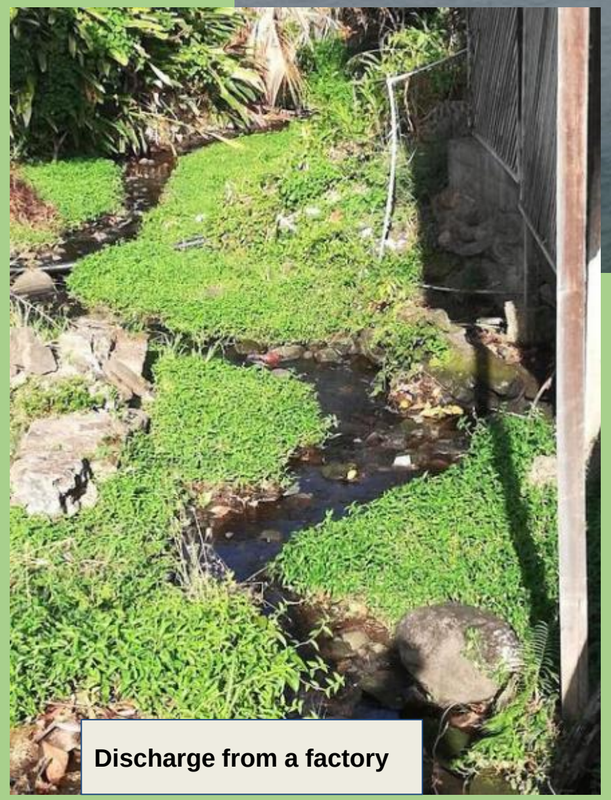
2) Indiscriminate use/practices

- **Development** : wetland destruction, site runoff, excessive land clearing
- **Agriculture:** Over application of synthetic fertilizers, misuse of pesticides, excessive land clearing, farming on slopes
- **Industry:** Poor waste management, untreated wastewater discharge, habitat destruction
- **Households:** Poor waste management, chemical misuse, poor waste management, excessive land clearing, grey water discharge, open-air burning

3) Limited institutional and technical capacity

- Monitoring and data collection
- Knowledge transfer
- Poor project implementation rate

Freshwater Ecosystems

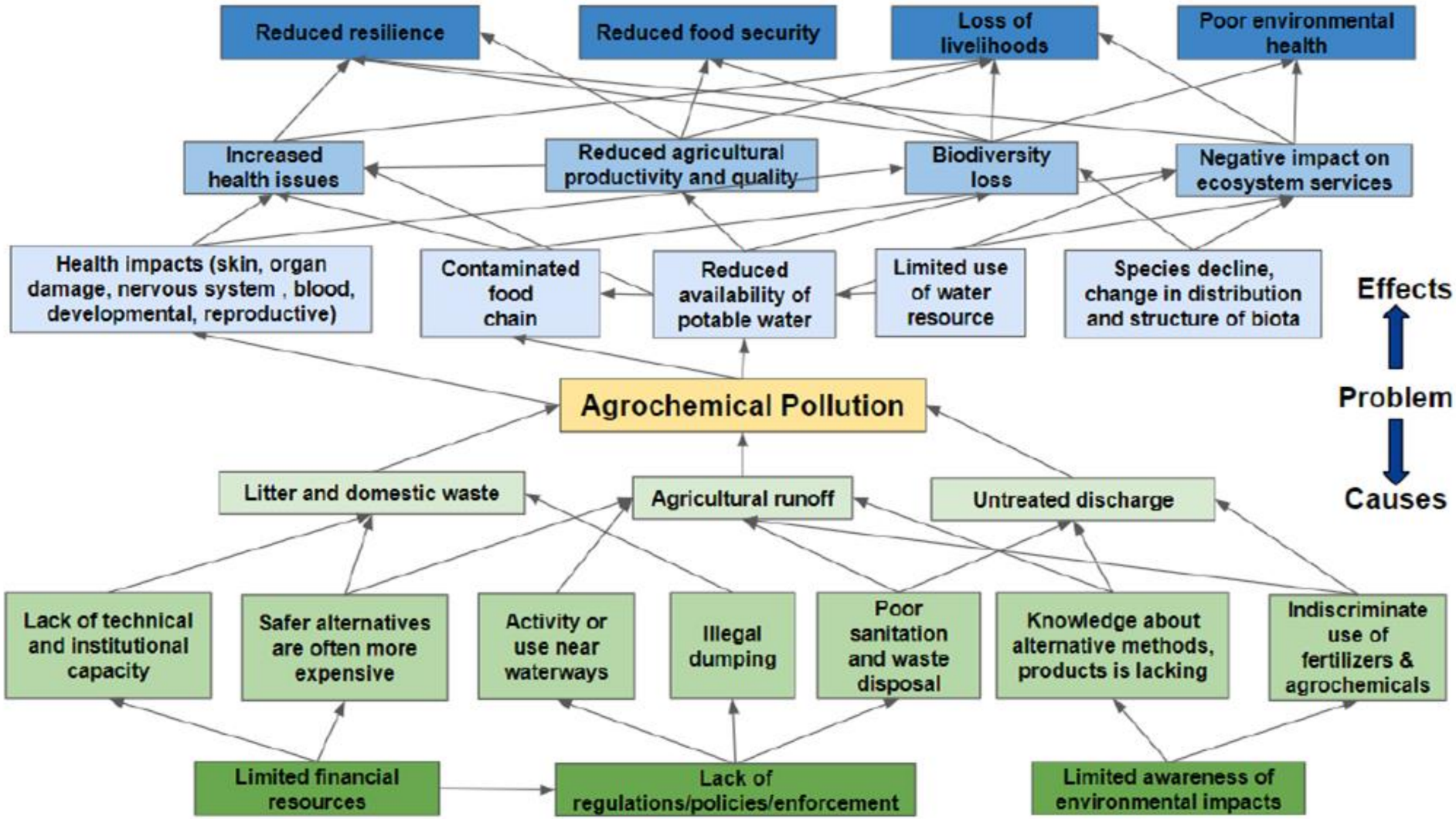


Discharge from a factory

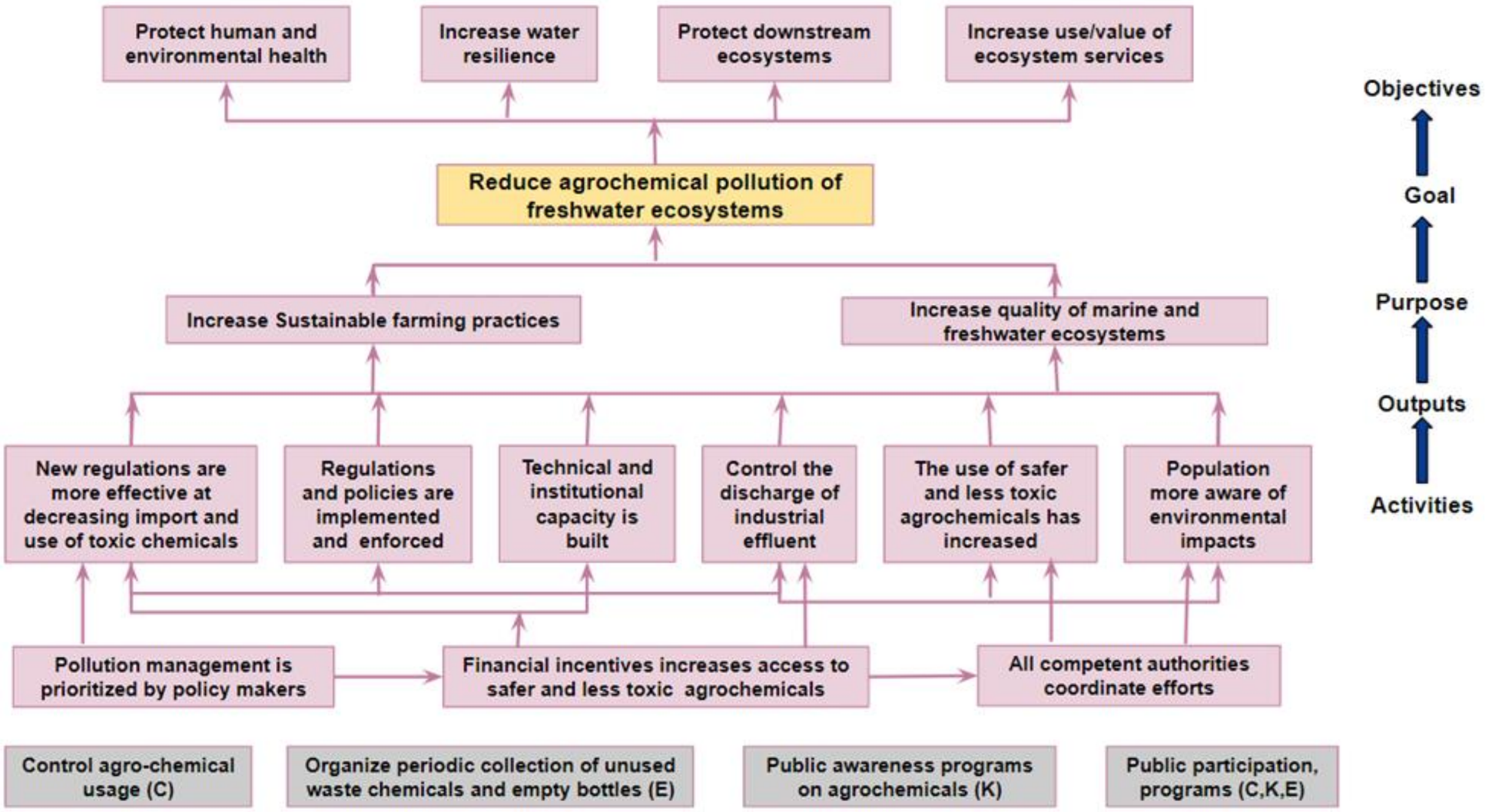
Key Threats/Issues

- Agrochemical Pollution
- Grey water & Sewage
- Nutrient Pollution
- Sedimentation
- Hazardous Waste

Problem Tree For Agrochemicals



Objective Tree For Agrochemicals



Policy Areas/Recommendations for Freshwater Ecosystems

Recommendations:

- Improved framework/infrastructure for water quality monitoring
- Public education on use/storage/disposal of pesticides/fertilizers/chemicals/hazardous waste
- Create an enabling environment for proper disposal of waste chemicals
- Enable community level action through incentives and participatory engagement
- Prohibit importation and use of chemicals that are banned in other countries
- Create an enabling environment for organic and climate smart farming, circular businesses, healthier lifestyle practices (tax credits, lower import duties, etc)

Regulations:

- Create or update protocol for construction/development sites (stormwater runoff, indiscriminate land clearing etc)
- Create or update protocol for road construction to ensure proper drainage
- Stricter regulations on residential sewer system construction
- Stricter regulations to protect against wetland destruction
- Public right/access to data - Right to know what's in our water

Coastal & Marine Ecosystems: Headlines

Coastal & Marine Ecosystems are under threat from multiple anthropogenic stressors

- Invasive Alien Species (Sargassum)
- Pollution (Marine Debris)
- Overexploitation of natural resources (unsustainable fisheries)
- Habitat Loss & degradation (Coastal developments)

Anthropogenic stressors cumulatively compromise the delivery of ecosystem services & threaten ecosystem health & human well-being

A suite of relevant Response Options to address identified challenges

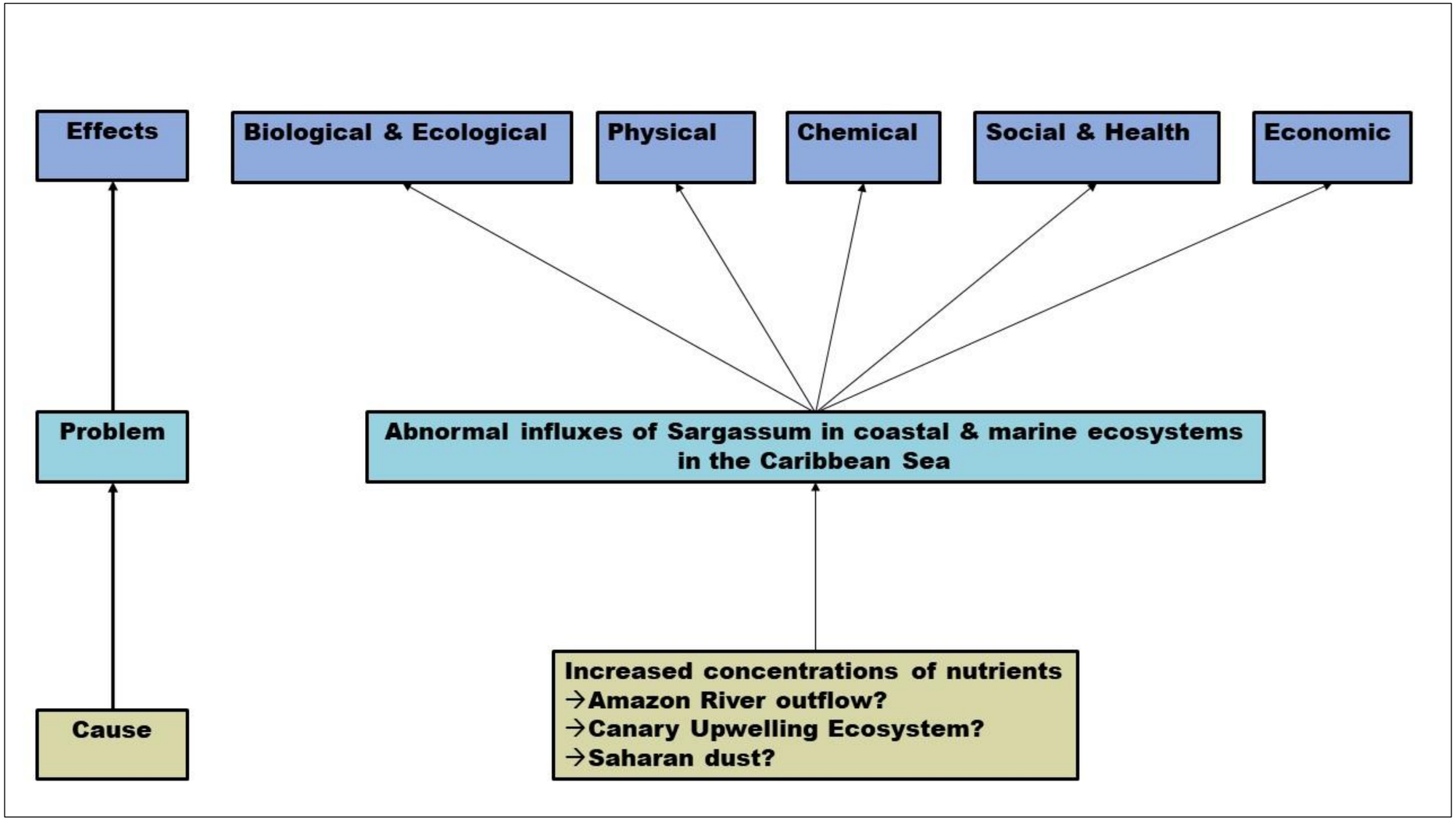
- Foundational (Knowledge & Information to promote evidence-based management)
- Enabling (Policies, Institutions & Governance to promote participatory, multi-sectoral & integrated management)
- Instrumental (Innovative Technologies & Practices, Markets & Incentives, Voluntary Action)

Coastal & Marine Ecosystems

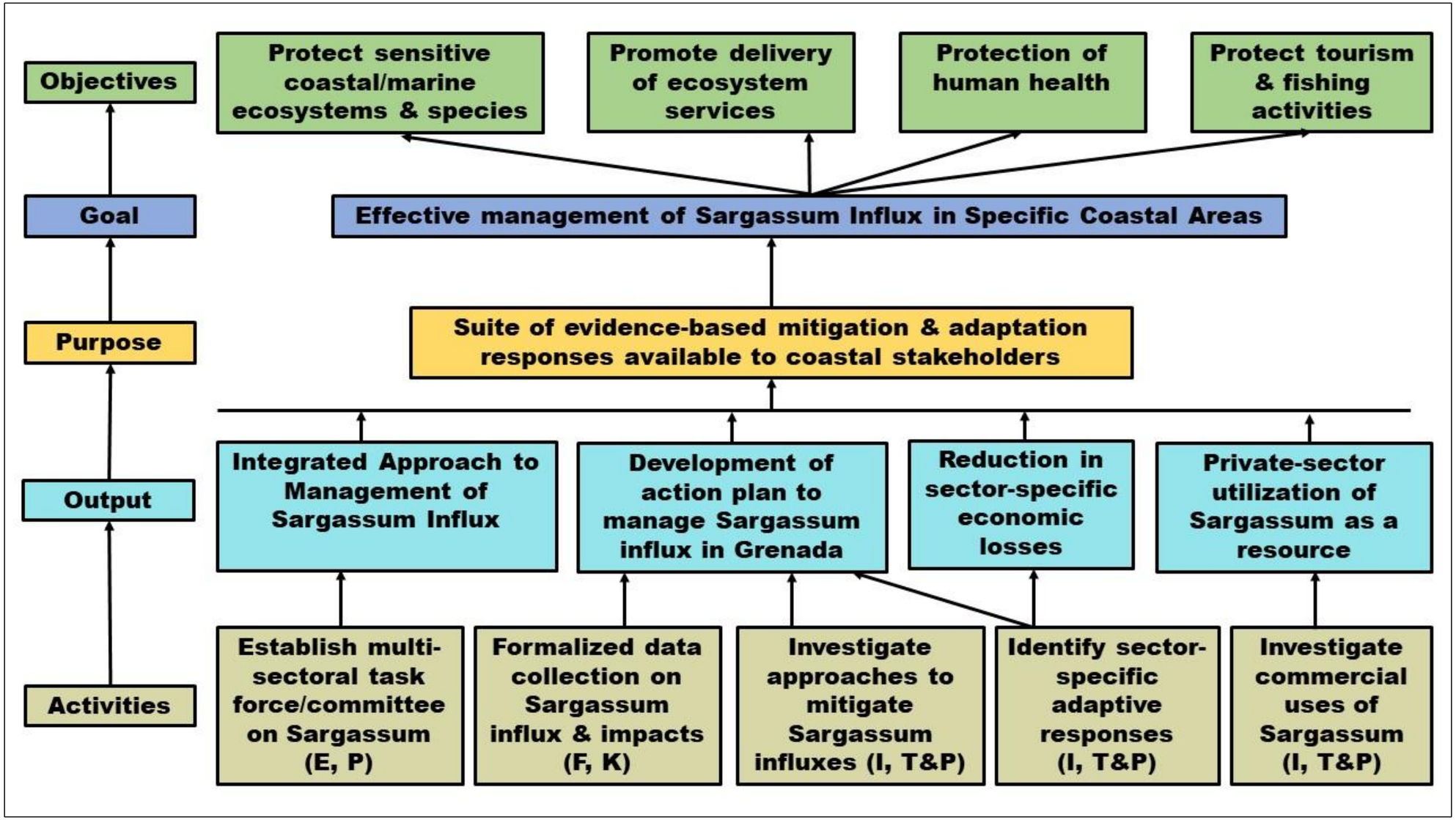
Key Threats/Issues

- Invasive Species (Sargassum)
- Pollution (Marine Debris)
- Overexploitation of Natural Resources (Unsustainable coastal fisheries)
- Habitat loss & degradation (Coastal Developments)

Problem Tree For Sargassum

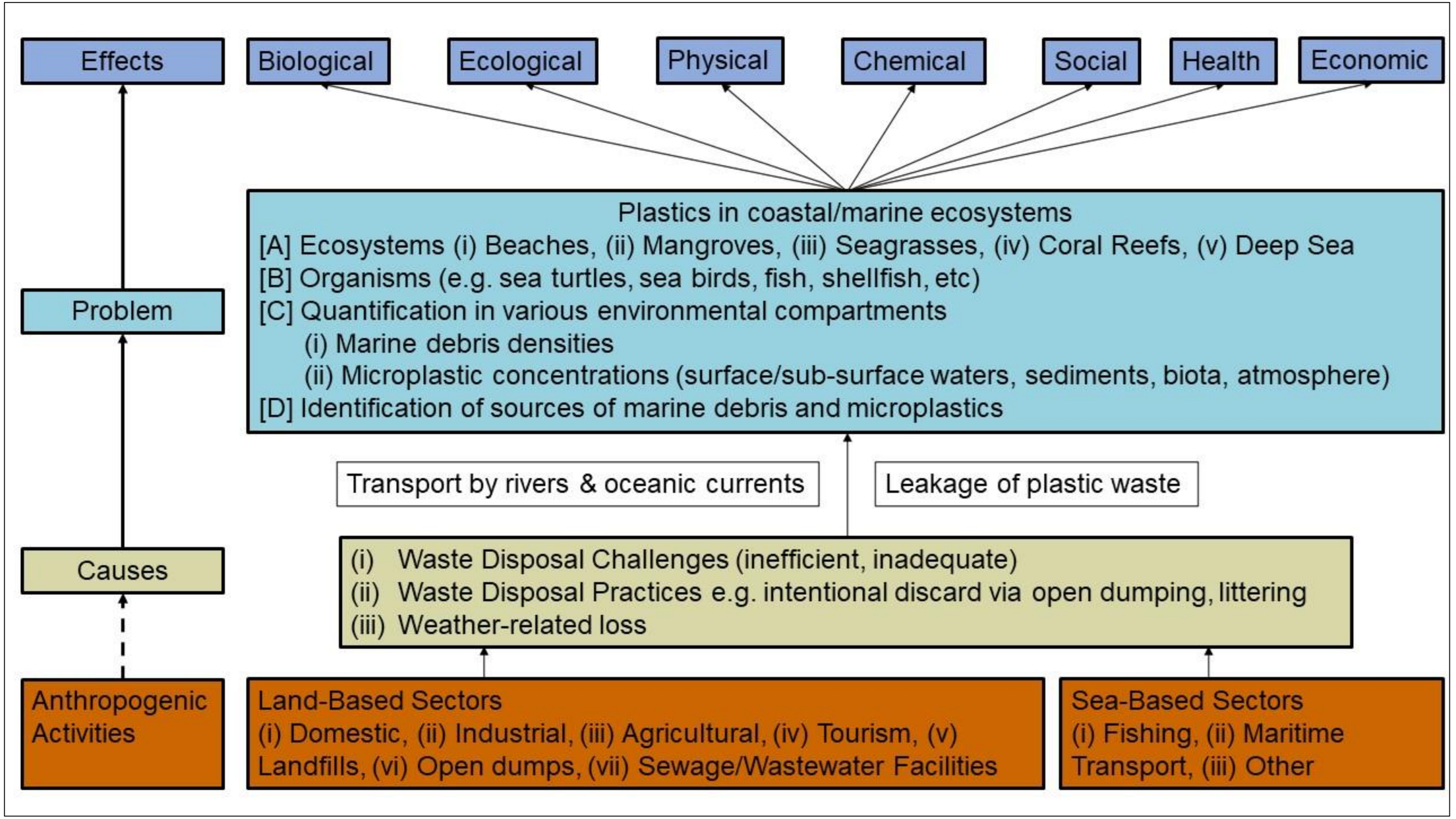


Objective Tree For Sargassum



Response Options (i) Foundational (F)-Knowledge (K), (ii) Enabling (E)-Policy (P), (iii) Instrumental (I)-Technologies & Practices (T&P)

Problem Tree For Marine Debris (specifically plastics)



Protection of Coastal & Marine Ecosystems

Coastal & Marine Ecosystems provide Grenadians with multiple ecosystem services:
(i) Provisioning
(ii) Regulating
(iii) Supporting
(iv) Cultural

There ecosystems are critical habitats for resident and migratory fauna.

Grenada already has some designated Marine Protected Areas:
(i) Woburn Clarks Court Bay
(ii) Grand Anse Marine Protected Area
(iii) Moliniere-Beausejour Marine Park
(iv) Sandy Island/Oyster Bed Marine Protected Area

Key Concerns:

(i) Several proposed Protected Areas have draft Management Plans. These need to be finalized, implemented and actively managed.

(ii) Actively managed MPAs will ensure that adverse impacts of anthropogenic activities are avoided and minimized.

Policy Areas/Recommendations for Marine Ecosystems

Recommendations:

- Improving/strengthening knowledge transfer between stakeholders (e.g. environmental literacy, school education drives, marine conservation practices, preservation of traditional and local knowledge)
- Investing in the improvement of existing data infrastructure to support the data collection and monitoring of fish landings, species stock and fisheries management
- Improving/Strengthening technical capacity of Fisheries Division data and extension services staff
- Supporting the Ridge to reef approach
- Finalization of the 'Protocol for the management of the extreme accumulations of Sargassum on the coast of Grenada' (assumption that the draft from 2016 has not yet been finalized)
- Finalization of the 'Grenada Sargassum Adaptive Management Strategy' (assumption that the draft from 2021 has not yet been finalized)
- Establishment of a National Task Force/Committee on Sargassum in Grenada
- Proposed MPAs are designated, draft Management Plans are finalized, implemented and the MPAs are actively managed

Regulations:

- Updated fisheries legislation to support the creation of co-management bodies

Ecosystem Restoration

Mandate #3 specified that we :

"*examine mechanisms to amplify the delivery of ecosystem services through ecological restoration, providing guidance as to where restoration would yield the greatest value for the economic and social well-being of Grenadians*"

Although a beneficial outcome, review of the evidence in previous chapters and the available literature and data suggests that mandate #3 requires new data generation, data analysis and modelling beyond the scope of this NEA

Instead, we provide the following guidelines

Restoration planning: Contextualizing approaches for mitigating Ecosystem service loss

Related to Anthropogenic Activities

During the planning stages of new developments, proponents ought to clearly outline how adverse impacts will be managed

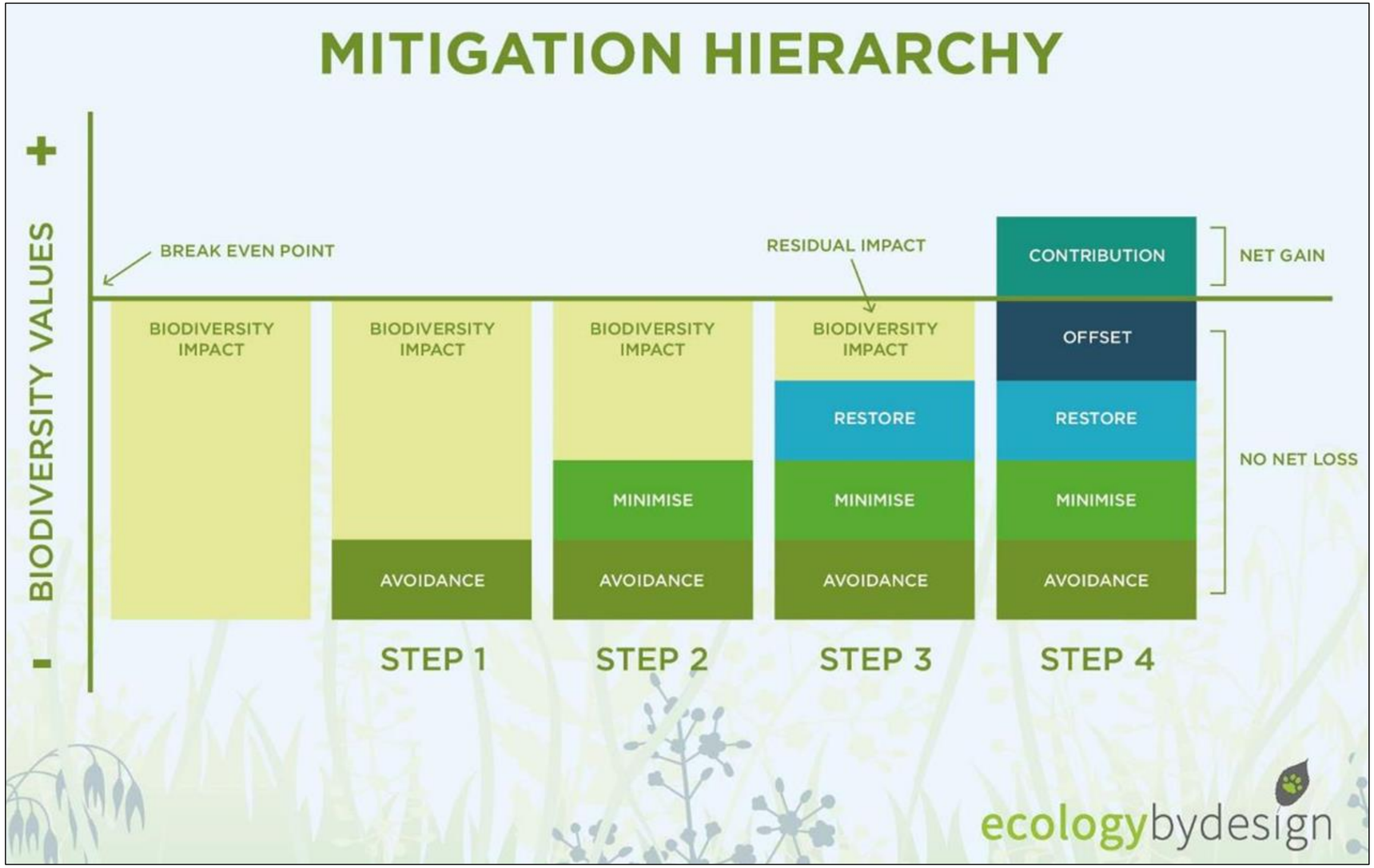
The mitigation hierarchy provides a means to manage adverse impacts:
(i) Avoidance (ii) Mitigation (iii) Restoration (iv) Compensation

Restoration is the 3rd option on the Mitigation Hierarchy. For anthropogenic activities, Option 1 & Option 2 should be explored first.

Related to Natural Events

Natural events (storms, hurricanes) are projected to increase in intensity & frequency due to a changing climate.

It may not be possible to avoid or mitigate impacts. When such events lead to habitat loss and degradation, restoration of ecosystems may be necessary.



Policy Instruments: Status & Opportunities

Issue/Problem (Ultimate)	Policy Area/Document	Sectors	Evidence	Confidence
Habitat degradation	• Implement draft Environmental Management Act • Implement Draft Land-use Policy • Redraft NBSAP & implement • Adopt Forest policy & National Parks Policy • Clarify agency responsibilities (e.g. watershed management) • Proposed MPAs should be designated, draft Management Plans finalized & implemented	• Physical planning • Agriculture • Environment • Forestry & National Parks • Water/NAWASA • Tourism	High	High
Competing land uses/sustainable land use planning	• Grenada National Land Policy (DRAFT) • Update EIA legislation to be more effective against destructive ecosystem outcomes	• Physical planning • Agriculture • Environment • Forestry & National Parks • Water/NAWASA • Tourism	High	High
Land tenure insecurity	• Grenada National Land Policy (DRAFT) • Designation of more national parks throughout the tri-island state	• Physical planning • Agriculture	High	High
Abnormal influxes of sargassum	• Protocol for the management of the extreme accumulations of Sargassum on the east coast of Grenada (DRAFT) • Grenada Sargassum Adaptive Management Strategy (DRAFT)	• Environment • Fisheries • Agriculture • Industry/Private Sector	High	High
Access to data and public right to know	• Redraft NAWASA's mandate to (1) monitor water quality (2) Notify paying customers • Ratify Escazú agreement	• Environmental health • Water/NAWASA	High	High
Construction /development issues	• Protocol for construction site activities to mitigate against environmental damage (landslides, water contamination etc.) • Protocol for road construction to mitigate against flooding • Updated protocol for residential sewage construction	• Physical planning • Environmental health • Industry/Private sector	High	High
Hazardous waste management	• Implement the Basel, Rotterdam, Stockholm and Minamata Conventions	• Environment • Industry/Private Sector	Medium	High

Finance Instruments: Status & Opportunities

Issue/Problem (Ultimate)	Policy Area/Document	Sector	Evidence	Confidence
Lack of sufficient budgetary allocation in agriculture for biodiversity enhancement and nature-positive farming	• National Agriculture Plan • Food and Nutrition Policy and Plan of Action for Grenada 2013-2018	• Agriculture • Finance • Industry/Private Sector • Environment	Medium	Medium
Lack of budgetary allocations specifically related to mainstreaming ecosystem services for habitat degradation	• Annual National Budget	• Finance • Physical planning • Agriculture • Environment • Forestry & National Parks • Water/NAWASA • Tourism • Industry/Private Sector • Energy	High	High
Lack of operating permits with annual fees for industries/business that uses the revenue to enhance environmental protection.	• Environmental Management Act (draft)	• Environment • Forestry & National Parks • Tourism • Industry/Private Sector • Energy	High	High

From Silos to Integrated Response

- The development of integrated responses to the challenges identified in the NEA is critical to making progress to improve ecosystem services

- Such an integrated response implies multi-disciplinary and cross-sectoral leadership, as well as innovative policy and financial approaches.

- Examples of NEA-relevant issues where this approach would be valuable include:
  - Land use planning and management
  - Land tenure issues
  - Water quality monitoring (government & university collaboration)

- Establishment of Cabinet-level oversight for cross sectoral integrated responses

Questions for Stakeholders

1. Do you have any additional policy recommendations? Which ones and why?
2. Are there other key issues/threats you believe should be discussed in this chapter? Which ones and why?
3. What is your ranking of the policy and financial solutions for each ecosystem?
4. What do you think are the most important response options when addressing environmental challenges? Why?

    (i) Foundational e.g. Knowledge & Information

    (ii) Enabling e.g. Policies, Institutions, Governance, Social Attitudes,

    (iii) Instrumental (Markets & Incentives, Technologies & Practices, Voluntary Actions)

1. When considering the integrated response approach, which option do you think would be more effective? Why?

    (a) Establishment of Cabinet level oversight **or**

    (b) Establishment of a cross-party parliamentary committee for cross sectoral integrated responses

6. What do you think is the single most important action that the NEA can recommend to affect change in environmental management in Grenada?

THANK YOU!

For more information, please contact:

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