



CityAdapt Policy Brief #2 – Community Focus Kingston: A City of Wood and Water

Practical Approaches to Using Urban EbA to Enhance Urban
Adaptivity and Resilience



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Abstract: Jamaica is often described as a ‘land of wood and water’ and Kingston, its capital city and largest metropolis, ought to embody that characteristic. Through both human actions and the effects of climate change, the city has instead experienced increases in drought, reduced green areas and natural habitats, increased high temperatures and the resulting deleterious effects on human health and well-being and biodiversity. This Policy Brief highlights the role that urban EbA approaches can play in restoring the city’s resilience to disaster risk, adaptivity to climate change and its overall sustainability. It outlines the roles and responsibilities of key actors in both strengthening and utilizing current laws and policies to accomplish this and highlights some practical steps that can be taken to improve the capacity of all stakeholders to build a health and sustainable city.

1. Cities at the Forefront of Climate Change

Cities have been identified as being at the ‘frontline of global responses to climate change’ⁱ. This is in recognition of the contribution that urban sprawl and urbanization make to the anthropogenic aspects of CO₂ emissions and the resulting impact on climate change. Globally, as is the case in Jamaica, cities house the majority of the world’s population, often in densely packed and geographically vulnerable locations. Cities are affected by peculiar environmental conditions, such as the ‘urban heat island effect’, where the observed temperature of cities is higher than that of surrounding communities, and typically experience higher concentrations of air, water and land pollution. Depending on their design and location, cities can therefore have an increased propensity and risk of flooding, heatwaves, droughts and poor air and water quality. In economies severely impacted by poverty, social and economic vulnerabilities within urban communities compound the deleterious effects of climate change issues on human health and mortality. It is therefore in cities that the negative attributes of climate change are most dire. Coastal communities, like those along the Kingston Harbour, may be further affected by rising sea levels, increased sea temperatures and diminished coastal biodiversity, which brings added disaster and livelihood-related risks for those who live near to or make their living from the seas.

At the same time, cities bring opportunities for scaling up climate adaptive solutions and therefore, proactive policies implemented within a city context can have a more profound impact on both the population and the environment. In this way, governments, international development organisations, researchers and activists have been innovating and analyzing ecosystem-based adaptation (EbA) solutions tailored specifically for the urban context.

Ecosystem-Based Adaptation is defined as ‘the use of biodiversity and ecosystem services to help people to adapt to the adverse effects of climate change’ (CBD, 2009). They fall under the wider umbrella of nature-based solutions (NbS), which are defined as ‘actions to protect, sustainably manage and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity effects’ (WCC, 2016).

Urban EbA can be described as a holistic approach to adaptation in urban and peri-urban areas, where the ecosystem, its assets and services are integral to how cities, including the most vulnerable communities within them, build their resilience to the effects of climate change. The Urban EbA approach is designed to address environmental, social and economic issues in an integrated way. It involves using inclusive and participatory methodologies to empower vulnerable urban communities to address the multi-layered impact of climate change, while sustaining ecosystem assets and the mutual benefits they provide to human well-being and biodiversity. The resulting strategies can address a number of adaptation and sustainable development targets, including improving the living conditions and aesthetic appeal of a city, reducing the cost of energy, increasing carbon sequestration, improving the health, wellness and livelihoods of its residents and their resilience to extreme weather events, while having a net positive impact on biodiversity.

2. Urban EbA as a Solution for Climate Adaptive Cities

EbA solutions are estimated to save governments between US\$3,000.00 and US\$18,000.00 per hectare per annum in carbon storage, stormwater reduction and reduced pollution (UNEP, 2021 p.11).

Climate change engineered solutions in cities can include a combination of:

- **Green Infrastructure**, which refers to utilizing natural and semi-natural ecosystems to mitigate the impact of climate change or enhance the protective role of nature, for example through the increased or enhanced use of vegetation in urban forests, gardens and farms.
- **Blue Infrastructure**, which places the focus on natural water systems, and enhancing the ecosystem services provided by healthy lakes, rivers, ponds, oceans and their related network of drainage and water supply systems.
- **Grey Infrastructure**, which focuses on man-made structures and the modification of building systems and physically engineered solutions to mitigate or adapt to the effects of climate change. They can include drainage systems, building technologies, seawalls, levees and similar structures.
- **Hybrid Solutions**, which integrate both natural and man-made approaches, with often more cost-effective and sustainable results than grey infrastructure (UNEP 2021).

Urban EbA solutions utilize green, blue and hybrid infrastructure, and seek to replace grey infrastructure with these alternatives in a manner that has mutually beneficial effects on human wellbeing and biodiversity.

INSERT 1: Greening the City

Jamaica's Nationally Determined Contributions under the UN Framework Convention on Climate Change identifies forestation initiatives as an important contributing strategy to increasing carbon sequestration rates locally. Forestation or 'tree planting' initiatives are often concentrated in rural landscapes, in open fields or existing forests. Trees are just as beneficial in an urban setting. In the city landscape, trees can be used to:

- Provide much needed shade on sidewalks and playgrounds.
- Create aesthetic appeal that improves the quality of life for urban residents and visitors.
- Contribute to food security and livelihood opportunities for economically vulnerable families.
- Attract pollinators, which in turn helps urban farmers and gardeners.

Under the City Adapt project, an Urban Food Forest is being established in the inner-city community of Rose Town. This is being implemented in partnership with the Forestry Department, which provides saplings and trains community members in their care and maintenance, and the Rose Town Foundation Benevolent Society, which will take charge of the trees' long-term care. Mango, ackee and mulberries are among the 1,500 trees that have been planted, and there are prospects for adding a community apiary to produce honey for sale. Once mature, the fruit trees are expected to provide a community resource and a source of pride for Rose Town residents.

3. How Urban EbA is used globally to build smarter, more resilient cities

The choice of EbA solution may depend on the environmental and socio-economic context of a given city. Examples of EbA solutions that have been utilized globally include:

- **Urban wetlands, bioswales, raingardens and water features** can be used to improve drainage, provide a more sustainable approach to storm-water run-off and introduce cooling elements within an urban landscape. Singapore has used similar urban blue infrastructure to restore waterways and reduce flood risks. China has launched ‘sponge cities’, installing rain gardens and other water collection features to handle the excess run-off from the monsoon season, and extend the cooling aspects of water features during the dry season (ICLEI, 2017).
 - **Urban water catchment and purification** systems can be critical to sustaining water supply in times of drought (UNEP, 2021).
 - **Permeable or porous pavements** in cities such as London have significantly improved storm water drainage, resulting in reduced flooding and replenishing of the ground water (ICLEI, 2017).
- Greening initiatives** are among the more common urban EbA responses and can range from simple tree-planting drives to more systematic programmes. For example, Melbourne, Australia utilized an Urban Forest Fund to provide a more strategic resource to the private landowners who account for 75% of its land mass to convert existing spaces (sidewalks, roofs, vertical spaces etc.) to green areas. Private owners may access the fund on a cost-share basis. This public-private/incentive-based model facilitated mass participation by the private sector in a state-led initiative designed to meet public policy goals. Similarly, Essen, Germany converted disused factories and mining facilities from grey to green infrastructure, using bioremediation strategies to deal with any toxic waste and developing urban farms, gardens and ponds to replace its former industrial zone. The resulting 230 hectare green belt helped the city to meet its goal of ensuring that every residence was within 500 metres of accessing the city’s green or blue infrastructure. The city thereby earned the award of European Green Capital for 2017 (ICLEI, 2017).

THE SCOPE FOR URBAN EBA

Using Green, Blue and Hybrid Infrastructure to Adapt to Climate Change



- **Green roofs and vertical gardens** in cities such as New York, U.S.A., Toronto, Canada, Tshwane, South Africa or Poznan, Poland provide new acreages for expanding biodiverse habitats, urban agriculture or urban gardens, in areas that are already heavily concretized. The resulting benefits may range from reducing urban heating, improve air purification and carbon sequestration, reducing noise

pollution, providing storm water collection options to increasing recreation and food production opportunities (Frantzeskaki et al, 2019; WWF, 2021; Zwierzchowska et al, 2019).

- **Urban and peri-urban farms** are another greening initiative that have the added benefit of contributing to food security, particularly in poorer communities, or reducing the carbon emissions that would otherwise arise from more complex food distribution and transportation chains. While this is done on a novel or hobby scale in some countries, Belgium has committed to sourcing 30% of its food from local sources by 2030ⁱⁱ. This is in part being implemented through networks of urban farms and converting unused or abandoned commercial spaces into greenhouses and aquaponic farms (UNEP, 2021).
- **Mangroves and reef systems** provide coastal cities with protection from storm surges and the associated risks (UNEP, 2021).
- **Nature-sensitive building materials and processes** can be helpful for mitigating the effects of higher temperatures, as they can involve integrating lighter, cooler materials into building construction (UNEP, 2021).

The range of Urban EbA options and solutions are designed to have multiple benefits on the social, economic and environmental development of a city, while improving resilience and adaptivity in a sustainable and cost-effective way. The graphic below outlines the types of initiatives that could be most useful in Kingston – based on their suitability for the city’s geographical location, size and municipal resources – and the range of benefits to be realized from each option.



4. Urban EbA in Jamaica’s Legal and Policy Framework

The vision of Kingston as a sustainable and resilient city has its genesis in the Jamaican Constitution, which guarantees to every citizen a right to a healthy environment. This is supported by Vision 2030, the National Development Plan, which captures government commitments to a range of social and environmental sustainability goals, including hazard risk reduction, adaptation to climate change and sustainable urban and rural development¹. The strategies identified to address these results include the development of sustainably planned urban centres with ecologically-friendly architecture and systems. This requires appropriate legislative, regulatory and urban planning support systems.

Urban planning, development and construction requirements are outlined in the Town and Country Planning Act, the Local Improvements Act and the Building Act, which together establish requirements for the design and approval of infrastructure, amenities, housing and commercial buildings within the urban space. The

¹ See National Outcomes 14 and 15, respectively.

approval process is guided by geographically-specific Development Orders, and implemented by multi-agency committees convened by local municipalities. Within the approval cycle, key environmental, public health and natural resource authorities must give their consent, and may impose conditions on a particular development. This process is guided by the **Natural Resources Conservation Act** and, depending on the nature of the project, **the Forestry Act, Water Resources Act** and **Watersheds Act** may also play a role. This is designed to ensure that environmental conservation and biodiversity issues are taken into consideration.

In recent years, the **Climate Change Policy Framework** and (proposed) **National Adaptation Plan** have had the effect of imposing on all government processes – including urban planning, design and approval processes – a specific requirement to address climate change adaptation. This is reflected in the **Kingston and St. Andrew Municipal (Provisional) Development Order**. Like other Development Orders, this is a tool used by municipal and sectoral authorities as well as developers, building professionals and communities in determining appropriate plans for developing urban areas. Any development to be constructed within the geographic region covered by the Development Order would first have to be approved by the relevant local authority as being consistent with its scope and regulatory content. The Kingston and St. Andrew Municipal (Provisional) Development Order, which was last updated in 2017, makes general reference to the impact of climate change on the parishes of Kingston and St. Andrew and requires all development activities to address climate change adaptation considerations. However, as the document remains in a provisional state.

From the Development Order, municipalities are expected to develop Local Sustainable Development Plans that provide more concrete and time-bound actions for implementing CCA requirements. The absence of an updated **Local Sustainable Development Plan** for the KSA region limits both public and private capacity to enforce CCA requirements in a consistent and predictable manner. Similar geographical planning tools are utilized by the National Environment and Planning Agency (NEPA) and the Urban Development Corporation (UDC) however their enforcement mechanisms tend to use soft or persuasive approaches, which leaves gaps in their consistent application.

INSERT 2: Using Ecosystem Services to Make Community Facilities More Resilient

Public buildings and amenities such as parks or parking lots are important icons within a community for integrating adaptivity and resilience in functional and cost-effective designs. The approach used in designing, building or refurbishing these government-owned or influenced spaces can promote the use of ecosystem services to build resilience to droughts, flooding, high temperatures and other weather extremes associated with climate change. Practical examples include the following:

- Permeable pavements and parking lots can reduce run-off during heavy rains, thereby decreasing flood damage.
- Rainwater harvesting on public buildings can reduce their vulnerability to droughts.
- Tree-lined campuses at schools and hospitals can improve shade cover, reducing temperature and improving the well-being of users.
- Ponds, rain gardens and other water features in local parks and green spaces can reduce ambient temperature and improve the urban aesthetic.
- Bioswales can capture and filter excess stormwater during heavy rains, reducing flood risk and improving the quality of groundwater.
- Roof gardens can have a cooling effect on buildings, and can be used to supplement school, hospital or community kitchens.

Under the CityAdapt Project, targeted innercity schools improved their resilience by introducing rainwater harvesting and planting trees. Similar practices can be institutionalized in public spaces by amending the Local Improvements (Amenities) Act and Development Orders to mandate all new or newly refurbished public spaces to integrate EbA in their design and promote a net-gain to biodiversity.

Fig. 3: Range of National Laws and Policies that address the Sustainable Development of Urban areas.



Fig. 3 captures the range of laws, policies and plans that together create a framework in which Urban EbA can be implemented. Notably, these laws and policies often lack the practical guidelines that can empower both public and private sector stakeholders to design, recommend, implement or monitor the use of ecosystem assets to enhance urban resilience and adaptivity. EbA should feature as the approach of choice for Jamaica’s adaptation initiatives, as well as mainstreamed across government, wherever feasible, in sectoral and community climate change initiatives. This can be achieved through identifying EbA as a policy priority in the CCPF and proposed Climate Change Act and National Adaptation Plan. EbA strategies cannot be implemented in a vacuum and must be complemented by strengthened regulatory protection of ecosystem assets and services, more comprehensive and sustainable urban planning and development approval mechanisms and a framework for incentivizing sustainable actions by private landowners. The deliberate reference in plans and policies to the use of EbA in addressing adaptation concerns is one recommended strategy. Additionally, practical tools, methods and incentives for empowering stakeholders to understand and apply the concepts of Urban EbA will be essential. Mainstreaming recommendations from stakeholders are highlighted in the Attachment.

5. What role can different stakeholders play in implementing Urban EbA

The implementing of a comprehensive and holistic urban EbA framework in the KSA region will involve the participation of a wide range of public and private stakeholders. This will include the roles and responsibilities outlined in the table below.

Urban Planning Authorities	Environmental Regulators	Municipalities	Private Sector	Communities
<ul style="list-style-type: none"> • Integrate Urban EbA in Building Codes, Development Orders, approval checklists etc. • Develop landscaping and forestry guidelines for the city, in collaboration with the Forestry Department • Integrate Urban EbA features in all local amenities and promote their impact on urban resilience and adaptivity. 	<ul style="list-style-type: none"> • Provide guidance and knowledge tools on the key features of an urban ecosystem and how these can be protected. • Use Tree Preservation Orders, restrictive covenants etc. to hold private landowners accountable for protecting urban biodiversity. 	<ul style="list-style-type: none"> • Build stakeholder understanding of Urban EbA advantages, designs and systems through communication and public education. • Integrate Urban EbA priorities in Local Sustainable Development Plans • Use incentives and promotional schemes to build interest in and use of green design methods. • Integrate communities in planning and decision-making • Incentivize Urban EbA initiatives that support community resilience. 	<ul style="list-style-type: none"> • Use green design elements and urban gardens to reduce building temperatures, reduce the cost of energy and improve the aesthetic appeal of private property. • Use permeable pavements to reduce the risk of flood damage and improve property resilience. • Use rainwater catchment and storage systems to improve drought resilience. • Support and finance EbA initiatives. 	<ul style="list-style-type: none"> • Support urban farms and gardens • Protect endemic species • Use rainwater catchment and storage systems to improve drought resilience. • Hold government agencies and municipalities accountable through community representation and advocacy.

6. References

- Frantzeskaki, Niki, Timon McPhearson, Marcus J. Collier, Dave Kendal, Harriet Bulkeley, Adina Dumitru, Claire Walsh, Kate Noble, Ernita Van Wyk, Camilo Ordanez, Cathy Oke and Laszlo Pinter. 2019. "Nature-Based Solutions for Urban Climate Change Adaptation: Linking Science, Policy and Practice Communities for Evidence-Based Decision-Making." *BioScience* (69) No.6, 455
- ICLEI. 2017. *Nature-Based Solutions for Sustainable Urban Development*. ICLEI
- IUCN. 2020. *Guidance for Using the IUCN Global Standard for Nature-Based Solutions. A User-Friendly Framework for the Verification, Design and Scaling Up of Nature-Based Solutions*. Switzerland: IUCN.
- Kabisch, Nadja, Niki Frantzeskaki, Rieke Hansen. 2022. "Principles for Urban Nature-Based Solutions." *Ambio* 2022 (51) 1388-1401
- UNEP. 2021. *Smart, Sustainable and Resilient Cities: The Power of Nature-Based Solutions*. UNEP
- UNEP. n.d. *Urban Ecosystem-Based Adaptation in Asia-Pacific*. UNEP CityAdapt
- WCC. 2016. *Resolution 069: Defining Nature-Based Solutions*. World Conservation Congress.
- WWF. 2021. *Making the Case for Investing in Nature-Based Solutions: A Case Study from Tshwane South Africa*. Cape Town: WWF
- Zwierzchowska, Iwona, Katarzyna Fagiewicz, Lidia Ponizy, Piotr Lupa and Andrzej Mizgajski. 2019. "Introducing Nature-Based Solutions into Urban Policy: Facts and Gaps. Case Study of Poznan." *Land Use Policy* (85) 161-175.

Attachment to Policy Brief #2: Recommendations for Mainstreaming Urban EbA in Developing More Sustainable and Resilient Cities

The following recommendations – informed by research and stakeholder perspectives – outline practical options and opportunities for integrating and mainstreaming EbA in policies, programmes and practices, to increase the sustainability and resilience of Jamaican cities.

1) *Recommended Actions to Mainstream Urban EbA in GOJ Programmes:*

- a. Develop interagency guidelines, procedures and training manuals that can guide approvals and decision-making across multiple entities.
- b. Strengthen NEPA's Development Assistance Centre to conduct outreach among developers and professions, educating them on the scope of current laws and policies, including provisions for integrating climate change adaptation in planning and approvals, and information and materials to introduce prospective developers to the benefits of integrating EbA in their proposed development plans.
- c. Identify GOJ-owned or operated buildings and properties to be upgraded into flagship/model facilities for integrating Urban EbA through green design.
- d. Integrate requirements for green design architectural elements and integrated management of ecosystem resources in all GOJ contracts for infrastructure designs, building design and construction, refurbishing, facility management etc.
- e. Strengthen Urban EbA knowledge and capacity among wider GOJ technical services that impact or participate in urban planning and development (e.g. National Housing Trust, Housing Agency of Jamaica, Social Development Commission, Jamaica Social Investment Fund, Urban Development Corporation, Ministry of Transport and Works, Local Government officers, Development Bank of Jamaica etc.).
- f. Sensitize local government elected and appointed officials in CCA, Urban EbA and the sustainable use of ecosystem resources and biodiversity to build community resilience (social, economic, ecological etc.).
- g. Prioritize the use of Urban EbA in urban renewal projects, through the proposed Urban Renewal Policy. In any implementation plan accompanying the policy, integrate strategies for protecting ecosystem assets and biodiversity in urban renewal planning and projects.
- h. Develop standards and guidelines for integrating EbA in National and Community Disaster Risk Management Plans, e.g. planting trees to reduce landslides or reducing flood risk through more sustainable management of rivers, gullies and riparian corridors.
- i. Ensure all plans and programmes impacting urban areas are stakeholder-inclusive, gender responsive and give consideration to different demographic groups living within or utilizing the space (e.g. youth, elderly, persons with disabilities etc.). Strengthen the inclusion and participation of civil society and communities through ecosystem governance arrangements.
- j. Integrate provisions in NEPA Smart Master Plans requiring EbA to be identified as the preferred modality for addressing CCA in urban development projects.
- k. Integrate EbA into NEPA/NRCA Conditions of Approval.
- l. Mandate early inclusion of Forestry Department in all infrastructure design and construction projects (including traffic and roads projects).
- m. Strengthen mandatory requirements and related sanctions for integrating biodiversity considerations in all areas of planning and design.
- n. Mandate and facilitate a programme of EbA innovations on government owned properties, including school and hospital campuses.
- o. Utilize flagship public amenities such as the proposed Portmore Climate Change Park or the new parliamentary buildings to integrate varied EbA strategies in a space in which they can be showcased.
- p. Build whole-of-government partnerships surrounding the implementation of EbA, e.g. Health sector promoting benefits to health and wellness; economic and community development sectors promoting EbA entrepreneurship, tourism sector promoting EbA in ecotourism; agriculture sector promoting use of ecosystem assets in sustainable urban agriculture), using results-based targets.

2) Recommendations for Mainstreaming Urban EbA through Standards and Guidelines

- a. Adopt the international building code on Green Construction in the local suite of codes. Integrate codes that seek to strengthen the sustainable use of ecosystem services in building design. Develop EbA standards for use in engineering and architectural designs and a locally-adapted Green Building Design Concept and promote its use among developers, engineers, architects.
- b. Use development approval standards and requirements to mainstream the use of rainwater harvesting, permeable pavements, bioswales, intrusion wells and other systems to improve the sustainable use of water resources and reduce flooding.
- c. Integrate CCA and EBA in 'Jamaica Landscaping Guidelines for NRCA' and the Town Planning Agency's Manual for Development.
- d. Complete (proposed) Guidelines on Urban Forestry and/or Green Policy for the City of Kingston. Use this to analyse any gaps, e.g. lack of endemic/pollinator- attractive shrubbery in Kingston, and make specific urban forestry recommendations that can be adopted by property owners and developers.
- e. Develop self-check systems for applicants for approval to assess their compliance with Development Orders, and their sustainable use of ecosystem services.
- f. Develop measurable, results-based targets from Kingston and St Andrew Municipal Development Orders that both technical and lay persons can track (e.g. 30% tree coverage, 50% use of endemic trees and shrubbery).
- g. Design an Urban Ecosystem Plan to be used as a manual for technical and non-technical users, outlining the ideal features of the urban ecosystem, including soil content, type and coverage of trees and shrubbery, species to be preserved or attracted, ecosystem services etc.

3) Recommended Actions for Strengthening Civil Society Support of Urban EbA:

- a. Strengthen NGO capacity to hold government entities accountable to declared standards, through Urban EbA-specific advocacy training and capacity building.
- b. Strengthen accountability mechanisms by which communities and civil society actors are empowered to hold government entities accountable for implementing Development Orders.
- c. Strengthen civil society capacity to implement Urban EbA initiatives through networking, coalition-building, advocacy and access to climate finance.
- d. Strengthen consultative discussions with civil society – including citizen's groups, climate activists, architects, urban planners, academia etc. – in reviews of Kingston and St Andrew Development Orders and related Local Sustainable Development Plan to be prepared by the KSA Municipality.
- e. Increase and enhance citizen's participation in preparing responses to national reports under climate change-related conventions.

4) Recommended Actions for Strengthening Private Sector Implementation of Urban EbA

- a. Strengthen both incentives and disincentives attached to preserving ecosystems and biodiversity. Review property tax regime to incentivize the use of ecosystem assets to improve property and community resilience, e.g. apply a property tax deduction to properties that reduce stormwater run-off through permeable driveways and parking lots or for installing bioswales on private land.
- b. Incentivize the use of Urban EbA in subdivision/ development planning and construction.

5) Education, training, communication

- a. Develop communications programmes, including simplified versions of urban development laws, regulations, development orders etc., to build public knowledge of how they can use the current legal and regulatory framework to support sustainable development, and sustainable cities. Build knowledge and awareness of the EbA strategies and innovations that are suited to Jamaican cities, with information on their appropriateness to different locations, costs and benefits to developers, private landowners and communities.
- b. Include EbA content in training provided to student planners, architects and building engineers and related professions in local universities, ensuring that sufficient attention is given to socio-culturally

and ecologically relevant strategies for sustainable use of ecosystem services, biodiversity and climate change adaptation in planning, design and construction.

- c. Develop a certification in urban EbA and make this a prerequisite for GOJ contractors to be eligible to bid on design and/or construction projects.
- d. Both public and private professionals engaged in planning, procurement, construction and refurbishing of public amenities should receive training and certification on the benefits and modalities of integrating EbA.
- e. Building Practitioners Board is empowered under the Act to certify and licence building professionals and should integrate training in urban EbA as part of their certification process for relevant professions.
- f. Develop and publicize specific tools and activities for preserving threatened species in the urban environment (e.g. catalogues on endemic trees and shrubbery, how-to-guides for attracting pollinators or creating nesting cavities in buildings) and implement some strategies through government owned or operated urban properties.
- g. Include EbA in all relevant training programmes for building professionals, including university degrees and continuing professional development programmes.
- h. Strengthen and expand broad-based sensitization on climate change adaptation and Urban EbA, particularly using examples and references that are easily recognized in the local context and promoting any working models that have been implemented in Jamaica.

6) Recommended Actions for Strengthening Monitoring, Accountability and Enforcement

- a. Establish monitoring and accountability mechanisms for Development Orders, Sustainable Development Plans and Master Plans. Include indicators that can be readily measured by professionals and lay persons (e.g. % increase in tree canopy coverage or number of new developments with rainwater harvesting features). Engage communities and civil society in monitoring and auditing public and private sector adherence to standards.
 - b. Strengthen NEPA's monitoring and enforcement capacity, to protect ecosystem assets from unsustainable use.
 - c. Implement ticketing systems for breaches of the Natural Resources Conservation and Town and Country Planning Acts.
 - d. Integrate Tree Preservation Orders as restrictive covenants on Registered Titles.
 - e. Integrate accountability mechanisms through GOJ's mandatory reporting under Sustainable Development Goals.
-