



Policy Recommendations: Strengthening the Role of Nature-based Solutions (NbS) and Ecological Engineering in Climate Adaptation: Based on the JW Eco-Technology Case Study

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Abstract:

To enrich the discussions on climate-resilient infrastructure within the framework of UNFCCC Belém Mission to 1.5, this proposal focuses on the innovative application of Nature-based Solutions (NbS) and ecological engineering. By showcasing the "JW Eco-Technology" as a tangible, successful case study, we demonstrate to the international community how forward-looking ecological technology can simultaneously achieve extreme weather mitigation, ecological habitat restoration, public health optimization, and green economic development—thereby providing a highly replicable practical paradigm for global resilient city construction. The JW Eco-Technology fully aligns with the COP31 Presidency's Three Arrows of Climate Action: actively implementing waste reduction and the circular economy, creating solutions that lower the carbon emissions throughout the entire building lifecycle, while simultaneously accelerating ecological restoration to highly efficiently protect the environment through concrete actions.

Foreword

I am Jui-Wen Chen, the Chairman of the Association of Sustainable Ecological Engineering Development (ASEED), a UNFCCC-accredited NGO Observer. Over the past decade since COP21, our team has continuously participated in the UN Climate Change Conferences, hosting numerous related events and advising the United Nations by providing the JW Eco-Technology as a climate adaptation solution. This solution was showcased at the COP21 Paris Conference in 2015, where it was hailed as a key technology for mitigating global warming. In 2022, it was further recognized on the UNFCCC Global Stocktake website, which announced JW Eco-Technology as a comprehensive solution for climate change adaptation and mitigation!

I am writing this letter to submit a proposal for the "Belém Mission to 1.5" call for proposals, titled: "Strengthening the Role of Nature-based Solutions (NbS) and Ecological Engineering in Climate Adaptation: A Case Study of JW Eco-Technology." This proposal has been presented at the recent UNFCCC SB64 side event under the theme "JW Eco-Technology as a Climate Adaptation Tool and Catalyst for Eco-Entrepreneurship and Green Economic Development," where it received highly positive feedback from the audience.

This proposal aligns perfectly with the scope of this call, aiming to support the submission, ambition enhancement, and concrete implementation of Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs). The project will thoroughly consider the following



key dimensions: 1. Innovative priority solutions encompassing policy, technology, practice, and investment; 2. Development opportunities across financial, technological, capacity-building, and institutional levels; and 3. The most prominent existing implementation barriers. Through these efforts, we aim to further deepen international cooperation, scale up climate ambition, and ensure the highly efficient execution of NDCs and NAPs.

The above proposal is respectfully submitted for your review. I sincerely hope that this solution will not only effectively enhance resilience against climate change, but I also look forward to collaborating with your organization to jointly drive green economic innovation and local implementation.

I. Context

The world is currently facing compounding risks exacerbated by climate change, including extreme precipitation, urban heat island effects, water stress, and infrastructure vulnerability. As countries update their National Adaptation Plans (NAPs) and promote sustainable infrastructure, increasing emphasis is being placed on the application of Nature-based Solutions (NbS), ecological engineering, and circular materials to enhance climate resilience and foster a green economy.

Against this backdrop, this proposal presents multiple innovative technologies and governance models, aiming to integrate them into the UNFCCC frameworks for technical cooperation, capacity-building, and pilot programs.

II. Rationale

While NbS and ecological engineering are widely recognized as effective climate adaptation strategies, gaps remain in the following dimensions:

- **Lack of quantifiable and replicable engineering case studies** that countries can readily adopt in their NAPs, urban adaptation strategies, and infrastructure planning.
- **Insufficient technology transfer and capacity-building**, particularly in developing countries and climate-vulnerable regions.
- **Limited engagement from green finance and the private sector**, which hinders the scaling up of NbS infrastructure.
- **Inadequate cross-sectoral governance**, making it difficult for cities, communities, and youth organizations to participate in the promotion of sustainable engineering.

Therefore, this proposal recommends strengthening policy support for NbS and ecological engineering under the relevant agendas of Belém Mission to 1.5 (NAPs, technology development and transfer, adaptation, urban resilience, capacity-building). It puts forward the JW Eco-Technology as a concrete case study to demonstrate its potential in climate adaptation and the green economy.



III. Proposed Elements for Consideration

(1) Strengthening NbS and Ecological Engineering within NAPs and Urban Climate Resilience Frameworks

It is recommended that the **SBI** (Subsidiary Body for Implementation), within its NAP guidance and technical support, should:

- Encourage Parties to assess and adopt NbS, ecological engineering, and circular material technologies tailored to their national circumstances.
- Facilitate knowledge exchange by sharing successful case studies (including JW Eco-Technology) through **NAP Central**.
- Support local governments and communities in participating in the planning and implementation of NbS infrastructure.

(2) Promoting "NbS Urban Pilot Programs" as Platforms for Implementing the Global Goal on Adaptation (GGA)

It is recommended that the SBSTA (Subsidiary Body for Scientific and Technological Advice) and relevant mechanisms should:

- Establish transnational pilot sites to demonstrate the benefits of NbS and ecological engineering in urban drainage, heat island mitigation, water resource management, and public health.
- Partner with local governments, communities, and youth organizations to ensure that pilot programs are inclusive and socially participatory.
- Establish quantifiable performance indicators (e.g., disaster risk reduction benefits, carbon footprint reduction, and local job creation).

(3) Enhancing Technology Transfer and Capacity-Building (TEC / CTCN)

It is recommended to:

- Include ecological engineering and circular material technologies in the CTCN (Climate Technology Centre and Network) technical assistance menu.
- Support developing countries in establishing low-cost, low-carbon, and maintainable sustainable infrastructure models.
- Encourage technology developers (including the JW Eco-Technology team) to participate in UNFCCC technical workshops, side events, and knowledge platforms.

(4) Fostering Green Finance and Private Sector Engagement

It is recommended to:

- Explore avenues to support NbS and ecological engineering projects through the GCF (Green Climate Fund), GEF (Global Environment Facility), Adaptation Fund, and multilateral development banks.
- Establish quantifiable ESG and climate resilience indicators to make such projects more



attractive to private sector investment.

- Encourage youth entrepreneurship and community-based green economies to boost local employment and the circular materials supply chain.

(5) Establishment of a Global Cross-Sector Governance Platform by the United Nations

It is recommended to:

- Establish a "Global Cross-Sector Governance Platform" with core technical foundation, e.g. the JW Eco-Technology, integrating cross-domain resources from nations, academia, the private sector, and communities to jointly address transboundary climate change challenges.
- Combine the sponge city carbon sink model with international carbon certifications to connect carbon credits from ecological restoration with the global carbon trading market, providing sustainable funding for green infrastructure.
- Coordinate with governments to incorporate the eco-technology into infrastructure regulations, and unite academic institutions, NGOs, the private sector, youth organizations, and community residents to implement multi-stakeholder co-governance from the policy level down to the grassroots.

IV. Case Example: JW Eco-Technology

Positioning

As a representative ecological engineering technology, JW Eco-Technology demonstrates how the integration of circular materials with advanced road pavement design can facilitate rainwater storage, groundwater management, urban green infrastructure, community engagement, and ecological entrepreneurship, thereby establishing a climate-resilient and sustainable infrastructure model.

Core Features

- **Climate Adaptation Benefits:**
 - Enhances urban drainage capacity.
 - Mitigates urban flooding risks.
 - Supports urban tree growth and alleviates the urban heat island effect.
 - Improves groundwater recharge and water resource management.
 - Creates underground ecosystems that improve air quality, sequester carbon-containing substances, and reduce carbon emissions.
- **Circular Materials and Low-Carbon Engineering:**
 - Utilizes locally sourced materials, including recycled plastics and cement concrete.
 - Minimizes carbon footprints, construction costs, and maintenance expenses.
- **Community and Youth Engagement:**



- Enables localized implementation, thereby boosting regional employment.
- Encourages youth involvement in ecological engineering and green entrepreneurship.
- **Green Economy Potential:**
 - Fosters a comprehensive and robust green industry supply chain.
 - Delivers quantifiable Environmental, Social, and Governance (ESG) benefits, possessing strong potential to attract international green capital.
- **International Cooperation Potential**

The JW Eco-Technology team can serve as a technology provider to actively engage in the UNFCCC technology mechanisms (TEC/CTCN), pilot projects, and capacity-building activities, assisting Parties in assessing and adopting ecological engineering models tailored to their national circumstances.

V. Conclusion

This proposal aims to assist the UNFCCC, under the Belém Mission to 1.5 framework, in strengthening the role of Nature-based Solutions (NbS) and ecological engineering in climate adaptation. By presenting JW Eco-Technology as a concrete case study, this submission demonstrates how such technologies can simultaneously enhance climate resilience, ecological restoration, public health, and the green economy.

This proposal does not seek the endorsement of any specific technology by the UNFCCC. Rather, it recommends incorporating technologies of this nature into policy discussions, technical cooperation, and pilot initiatives as viable options to support Parties in building more resilient, low-carbon, locally thriving and sustainable cities of the future in the face of the climate crisis.