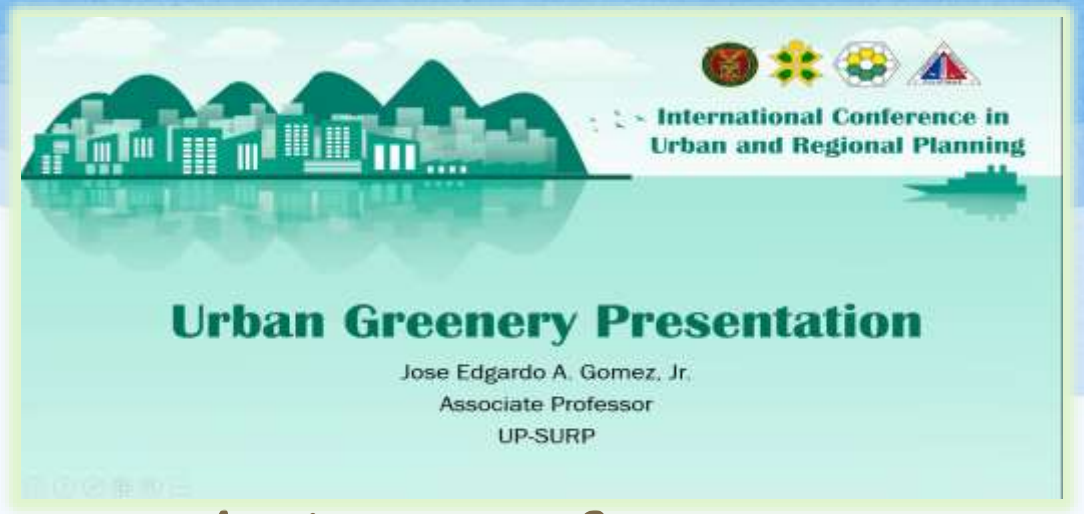

Going Native: Possibilities for Planning with Indigenous Tree Species for the Sustainability of Cities in a Southeast Asian Context

A Presentation by
Dr. José Edgardo A. Gomez, Jr.,
Associate Professor,
University of the Philippines, School of Urban & Regional Planning

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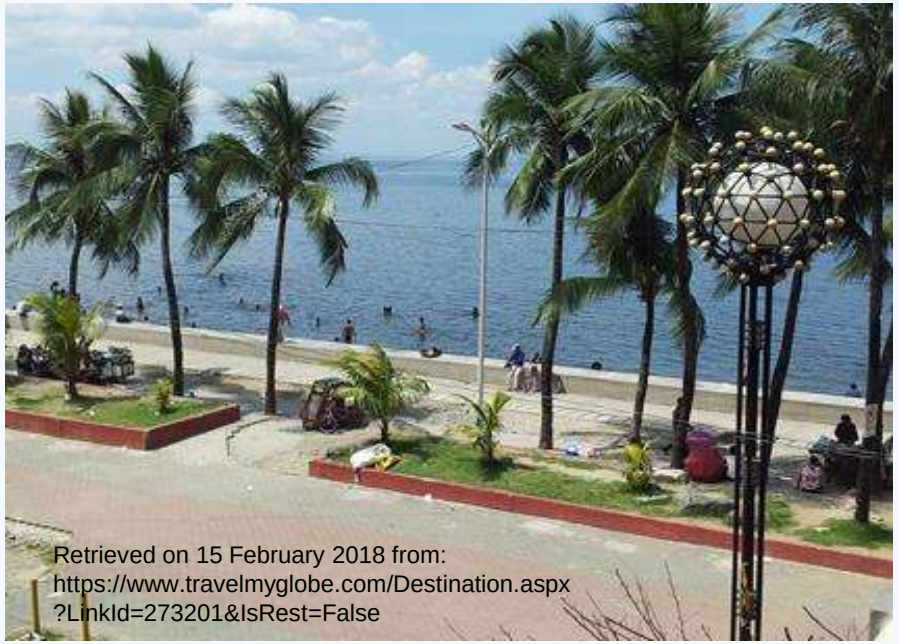
Introduction and Impetus for Research

- There have been various attempts at beautification of the urban landscape in Metro Manila.
- As an example, the Baywalk of Manila has gone through at least three transformations, with various experiments in vegetation.
- Many projects use fast-growing exotic species for relatively "instant" landscaping.
- This research explores the possibilities of using native plant species for the longer term, as incorporated in the planning process.



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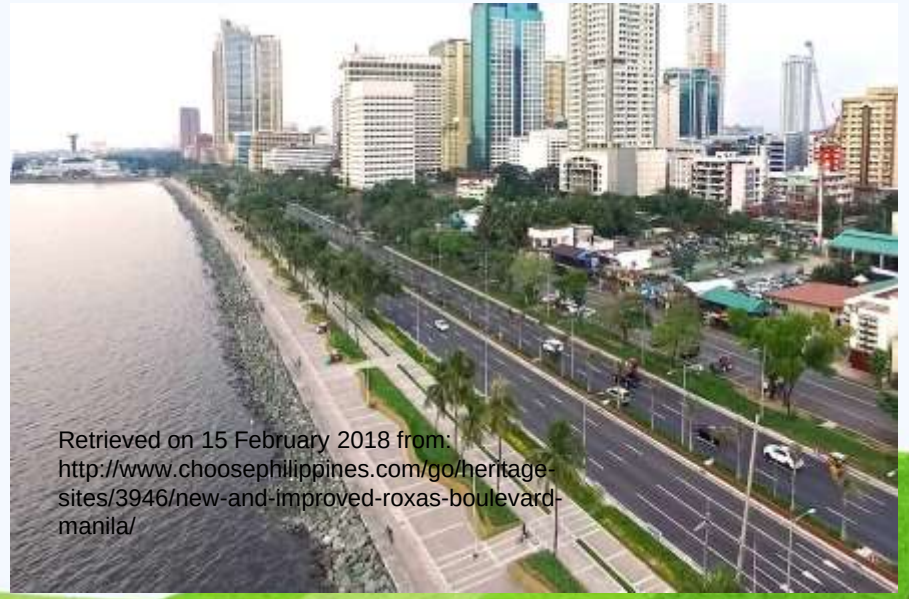


Retrieved on 15 February 2018 from: http://www.choosephilippines.com/go/heritage-sites/3946/new-and-improved-roxas-boulevard-manila/

Site, Scope and Limitations of the Research

- Washington Sycip Garden of Native Trees, and the rest of U.P. campus. Quantitative, on-site field inspection of species.
- Focus on tree species, rather than shrubs, forbs, and grasses, although these were encountered in the course of research.
- Study period: 2017, supplemented by past research and observations since 2008.

Category	Definition	Examples
Endemic	Exclusively native to the biota of a specific place.	Tectona philippinensis
Indigenous	An indigenous species may occur in other similar areas, and came on its own (i.e. through natural processes) to thrive in a particular place.	Cocos nucifera, Pterocarpus indicus.
Exotic (Non-Native)	An exotic species was introduced on purpose or accidentally, due to human vectors.	Swietenia macrophylla ; various acacias

Review of Related Literature

- The use of naturally-occurring vegetation has salutary effects on the environment.

- Cities that do urban forest management help clean the air through: increase the number of healthy trees (hastens pollution removal), sustain existing tree cover (maintains pollution removal levels), maximize use of low volatile-organic-compound (VOC) emitting trees (reduces carbon monoxide formation), sustain large, healthy trees (large trees have greatest per tree effects), use long-lived trees (reduces long-term pollutant emissions from planting and removal), use low maintenance trees (reduces pollutants emissions from maintenance activities), reduce fossil fuel use in maintaining vegetation (reduces pollutant emissions), plant trees in energy conserving locations (reduces pollutant emissions from power plants), plant trees to shade parked cars (reduces vehicular VOC emissions), supply ample water to vegetation (enhances pollution removal and temperature reduction), plant trees in polluted areas or heavily populated areas (maximizes tree air quality benefits), avoid pollutant sensitive species (increases tree health), and utilize evergreen trees for particulate matter reduction (year-round removal of particles)…(Anyanwu & Kanu, 2006)

By promoting quality green space within cities, biodiversity can be protected and enhanced, and can also be brought closer to city dwellers (ICLEI, 2008)

However, this must be contrasted against the wider general movement to reestablish greenways or urban green open space in cities, which has already taken root in cities like Singapore and even Jakarta respectively, where trees appropriate for windbreaking, poor soil, water absorption, noise and odor mitigation, and aesthetics have already been identified (Tan, 2004; Purnomohadi, 1994)

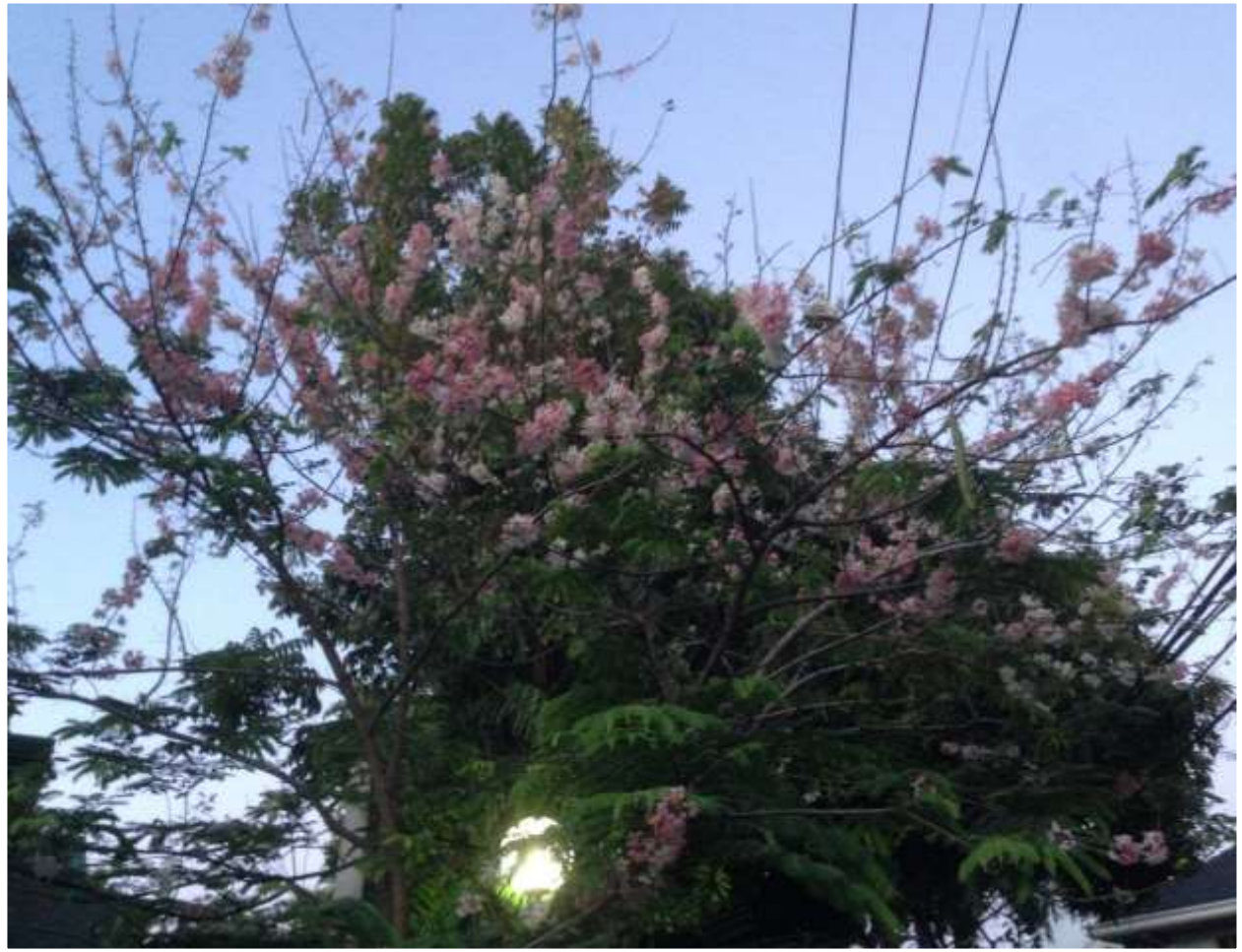
(1) Plants retain and increase the quantity of water available to the city, (2) they improve water quality, (3) they have several biological functions, including serving as habitat, and (4) they have other urban environmental benefits such as provision of shade. (PBES, 2007)

The urban green space system develops from convergence to scattering, from scattering to relation, from relation to fusion, and finally to network linking and fusion of urban and suburb area (Wuqiang et al, 2004

Conceptual Elements

- Key Ideas Filtered from the Review of Related Literature:

1. Greenery generally imparts health to the urban environment, but certain types are appropriate for, or associated with certain spaces or situations.
2. Indigenous vegetation cannot always thrive in urban environments where natural conditions have been drastically altered, and may need initial support to get established.
3. Mindset is important: citizens need to appreciate the availability and adaptive qualities of native species.



Why Go Far Away and Spend More?

Balayong

(Palawan Cherry Blossom)

The Metropolitan Environment: Polluted

Some Aspects that Urban Vegetation May Alleviate:

High Carbon Monoxide (>50% of sources) air content

4,000 to 6,000 tons of garbage per day (solid waste)

Hundreds of thousands of tons of particulate matter, sulfur oxides and nitrogen oxides.

Manila Bay, where phosphate levels are double the healthy 0.015 mg/L, is prone to eutrophication of the water.

It may also be argued that the aesthetic effect of native greenery can effectively counter visual blight, a form of perceived pollution of the landscape vista.

A Planning Approach: Platform, Waterways, and Built Environment

https://en.wikipedia.org/wiki/Pasig_River, retrieved 21 February 2018

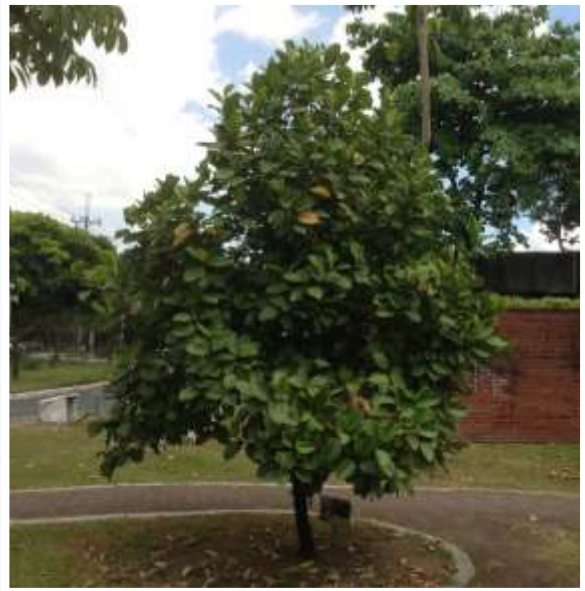
Planning with nature means taking into account qualities of the natural land platform, and the waterway.

Planning for indigenous native vegetation should take into account features of the non-natural built environment.

Selecting Species from the Fieldwork: Function, Form, Durability

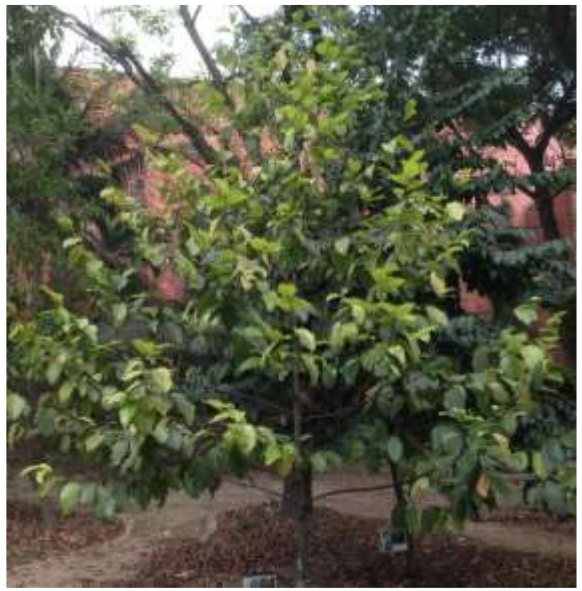
Pollution Mitigation, Arid and Saline Areas

Statuesque Trees, Tall Hedges, and Medium Height Plants

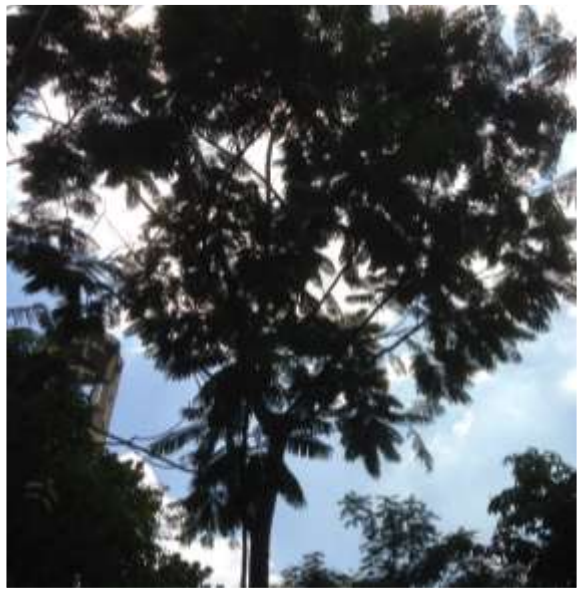


Ornamentation, Shape, and Fragrance

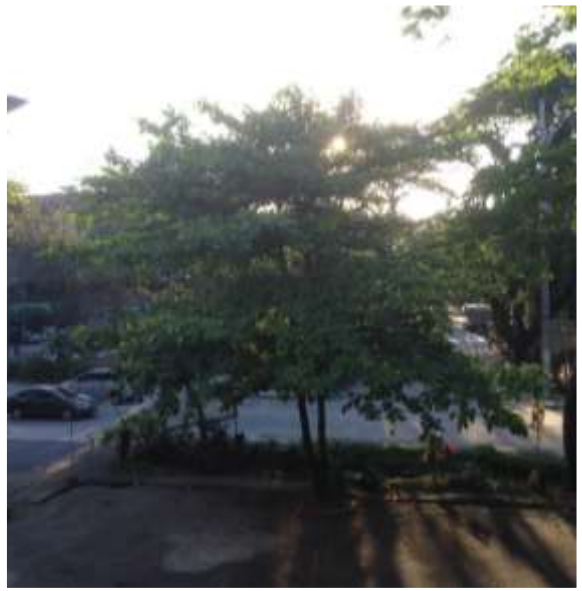
Selecting Species from the Fieldwork: Function, Form, Durability



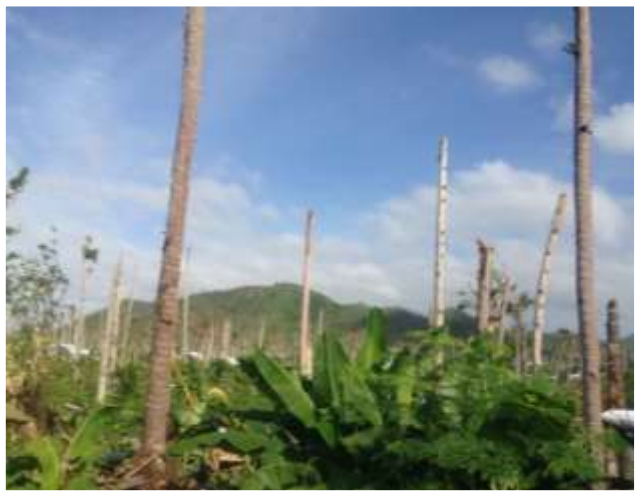
Carbon Capture and Urban Forestry



Other Landscaping Uses



Coastal Protection



Challenges of Site-Species Matching and Vulnerable Stages

It may be necessary sometimes to assist indigenous vegetation in getting established in the first place. In other cases, severe weather disturbances can destroy even local species, along with maladapted foreign ones.

Putting It All Together in Planning

(1) Incorporating a preference for native species: in the planning process itself, as part of both public consultation and technical analysis for environmental management and urban design, both as policy decision in the Comprehensive Land Use Plan (CLUP) and as part of development projects in the Comprehensive Development Plan (CDP).

(2) In the Forest Land Use Plan (FLUP) as applicable to certain LGUs that do agroforestry, or maintain protected areas.

(3) In the preparation of Disaster Risk Reduction and Management plans and protocols, especially for evacuation areas, erosion mitigation in slopes, and other instances where planting may play an important role.

(4) As part of problem-solving in critical areas that need bio- or phyto-remediation and brownfields slated for landscape restoration.

(5) Actual plan implementation in specific sites, or for beautification purposes, for instance.

Support Structures: Implementing and Maintaining Native Trees and Other Local Vegetation in Philippine Cities

Initial Establishment

- (1) Specifically identified sites for native species propagation and recognition as such
- (2) If not in protected grow-out areas, provision should be made for special tending of initially vulnerable tree species.

Later, Basic Practicalities

- (1) adequately knowledgeable and trained personnel,
- (2) a functional plant nursery with clean water supply that produces seedlings, saplings, and cultivars for propagation and replenishment of species,
- (3) an office and laboratory as needed, and vehicles capable of transporting personnel, plants and equipment,
- (4) public information materials and a communication program, and
- (5) an adequate annual budget to sustain and even expand operations

Conclusion and Recommendations

- This research has shown that indigenous plant species, in particular native trees, are plentiful and practical of use in urban areas of the Philippines, and as seen in the sites, are already able to thrive under conditions where vehicular and pedestrian traffic are present.
- They are not however, necessarily quick and low-maintenance solutions, hence may require management over a longer planning horizon (15-30 years).

Further research still has to be done on specific growing patterns and responses of such trees in the urban environment.

It is suggested that a follow-up study be done for selected species, in order to test their hardiness and landscaping appropriateness for the long-term. (Longitudinal studies). The results should then be incorporated into long and medium-term planning projections.

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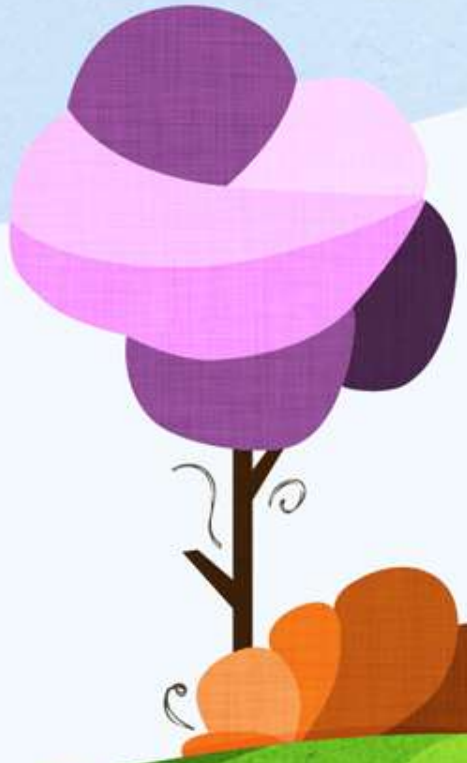

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Note: The infamous Payatas dumpsite of Quezon City has already been closed and rehabilitated, and the San Mateo, Rizal dumpsite has been abandoned as well. The Catmon dumpsite in Malabon is also temporarily closed.

MPN = Most Probable Number, a method used for estimating fecal coliform in water samples.

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End of Presentation. Thank You!