

County-based Governance of Participatory Restoration and Survey for Wetlands in Taiwan

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Taiwan has experienced a tremendous increase in human population in over the past fifty years

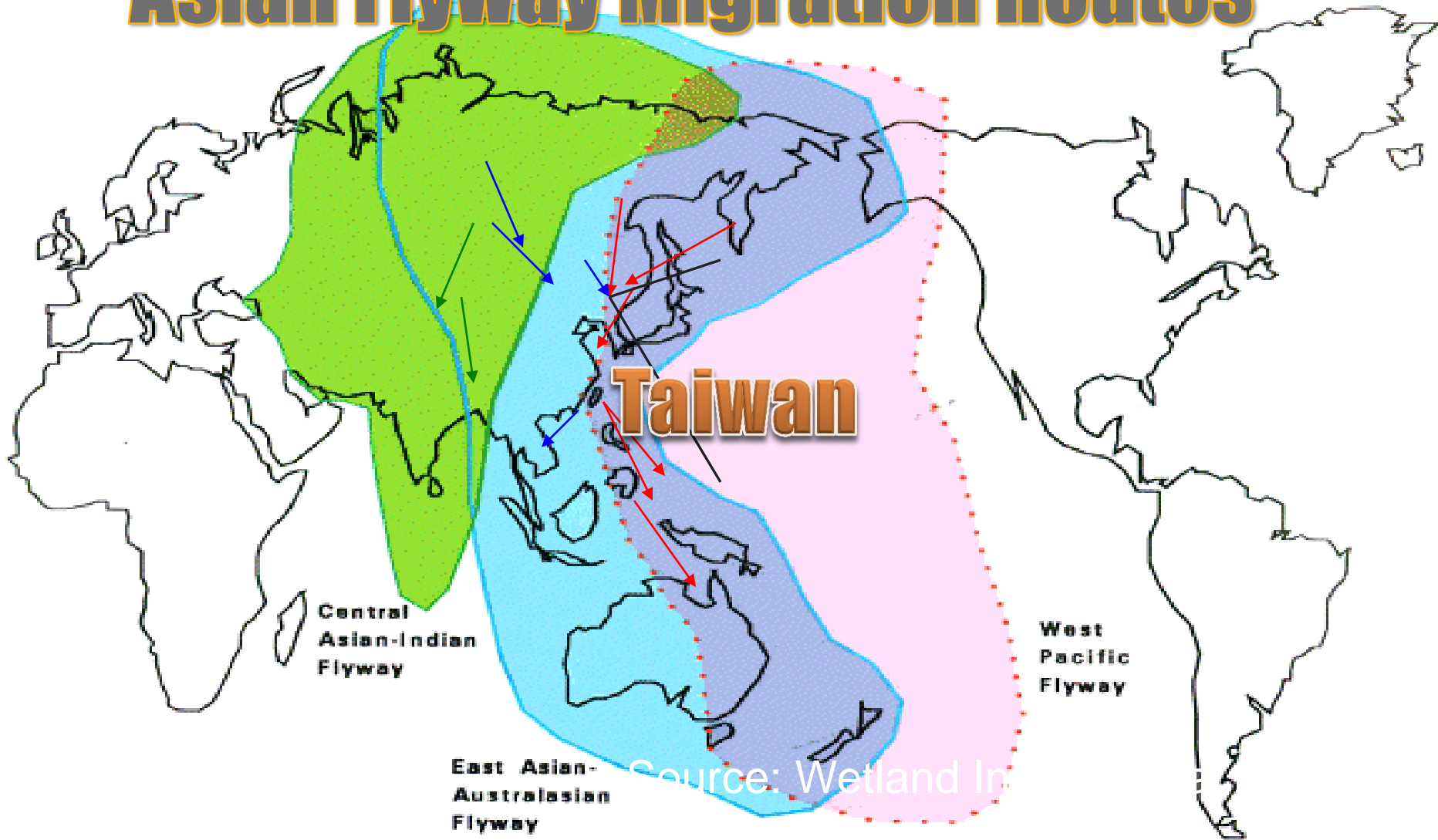
☑growing from 6 million in the 1950s to 23.2 million by 2011.

☑the population density was among the world's second highest at 644 people/km²



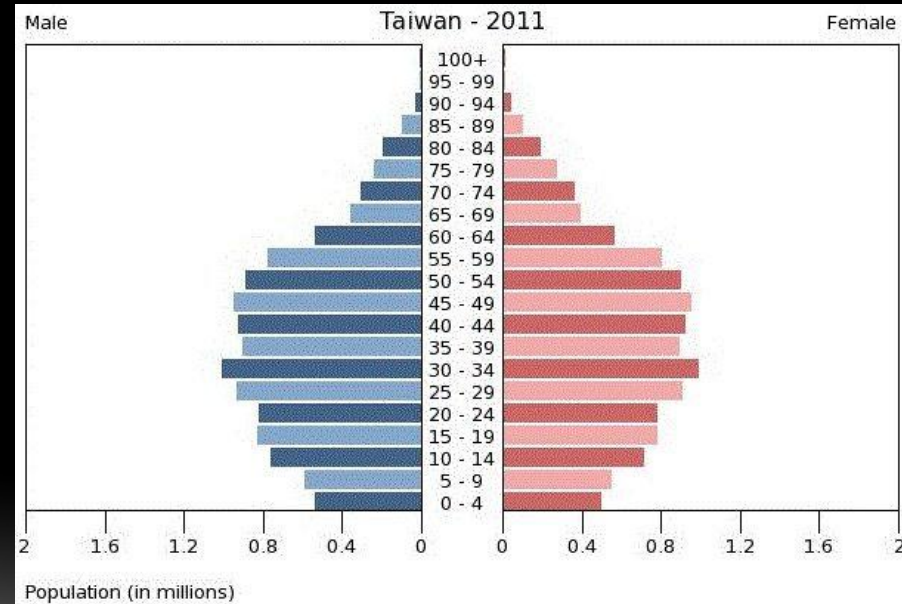
Taiwan

Asian Flyway Migration Routes



Scarcity of natural resources

- Immense population pressure causes
- massive urban sprawl
- cumulative results
- placed tremendous burdens on the island.



Utilized from the public domain

- ☑ Forests, water, and soils.
- ☑ Landscape destruction
- ☑ Habitat degradation



Landscape Change

An aerial photograph showing a city with a large river and surrounding landscape. The river flows through the center, with a highway bridge crossing it. The surrounding area is a mix of urban development, green spaces, and agricultural fields. The sky is clear and blue.

Tablelands and plains have largely been converted.

- agricultural,
- urban,
- industrial uses.



PHOTO COURTESY TO CHEN, MING-MING

CONSTRUCTION AND PLANNING AGENCY

Vigorous economic activities

- **Vigorous economic activities on misappropriated lands have been associated with increased pollution of**
 - ☑ **the air,**
 - ☑ **water,**
 - ☑ **and soils.**



NO PRISTINE FOREST LEFT

No pristine forest left on the tablelands and plains, and only a few small woodland patches remain in the foothills.



Fragmentation of biomes

- **Fragmentation of biomes and habitat degradation has placed pressure on biological diversity.**



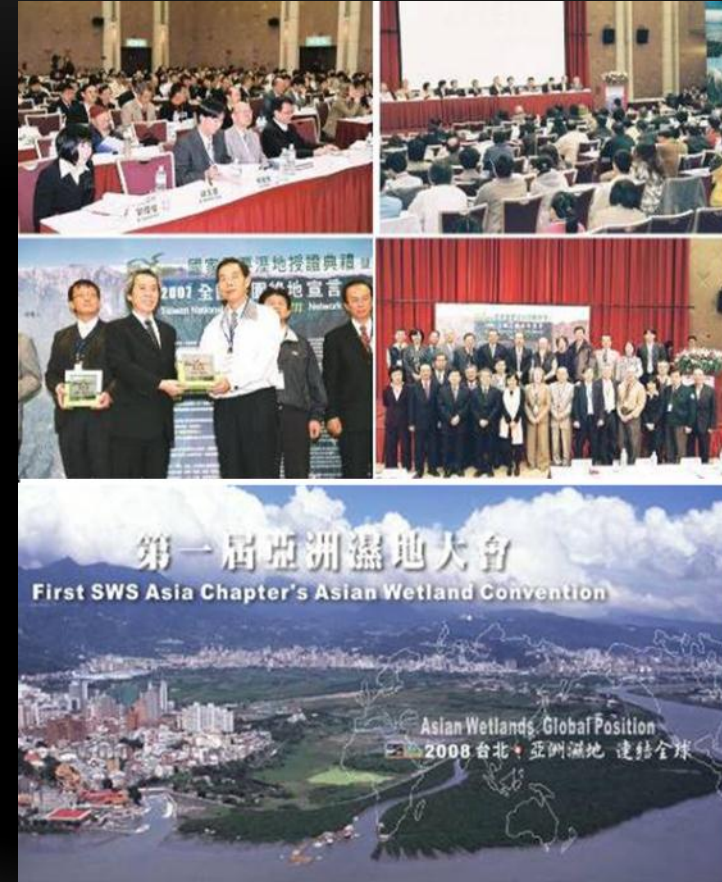
INTECOL

- Since the 8th INTECOL International Wetland Conference (2008) and COP 15 Copenhagen Climate Summit (2009) have been held from the years of 2008 and 2009 due to climate rapid change, wetlands have been explored their outstanding capabilities to reduce greenhouse gases and provide biodiversity.



History of Wetland Conservation

- 82 Wetlands of Importance have been designated
- The branch proceeded to develop "Wetland Conservation Act (draft)"
- Promote wetland biodiversity monitoring system of standard operating procedures (SOP)
- Build national survey database for the importance of wetlands
- Join the Society of Wetland Scientists (SWS)
- Organize the "First SWS Asia Chapter's 2008 Asian Wetland Convention"



History of Wetland Conservation



Construction and Planning (Taiwan CPA) Rule

- According to CPA's Rule, the Urban and Rural Development Branch (The Branch), CPA has developed the guideline for three objectives, such as:
 - wise uses of wetlands resources
 - construction of entire national ecological network of important wetlands
 - enforcement of international exchanges to promote wetland conservation.



History of Wetland Conservation



Since this area is one part of the ancient Taijiang Bay Area, fishermen use the scaffolding techniques to flourish floating oyster, aquaculture, and coastal fishing industry (i.e., eels) in the estuary, which recorded a total of 6 families and 22 species of crabs. Taiwan fiddlercrabs (*Uca formosensis*) are found as one of Taiwan's largest ethnic group. In addition, the areas have been collected 200 species of clams, including *Pseudogaleomma japonica* (*Galeommatidae*). While wintering seasons, fishermen catch eels as aquaculture industry, with all kinds of fishing nets collected *Nassarius teretiusculus*, *Olivancillaria steeriae*, as well as other shellfish. Fishery resources include *Liza macrolepis*, *Valamugil cunnesius*, *Metapenaeus ensis*, *Cyclina sinensis*, and molluscs.



**Taijiang National Park
Has been designated
during 2009.**

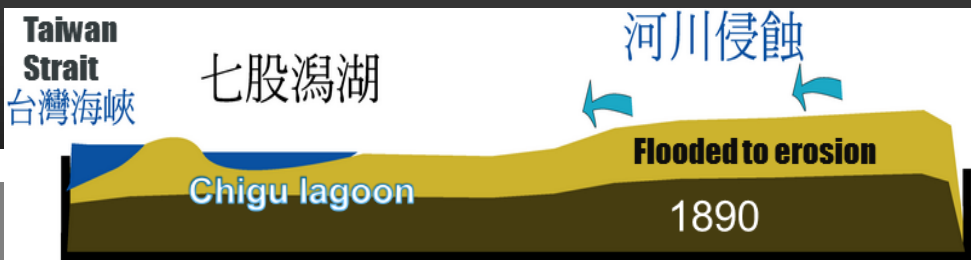
As the earliest developed region in Taiwan, Tainan City, where the Taijiang National Park located is rich in cultural and traditional natural resources, especially in temples and cultural events. The prominent temples in the coastal area attract millions of visitors to the region every year. In addition to religious attractions, the area also possesses rich natural scenery along the coast and other cultural resources such as the traditional salt ponds. The historic and cultural resources of Tainan do much to define the City's rural character to one of the Ramsar's sites.



Black-faced Spoonbill (*Platalea minor*)

We are confident that the environmental and land-use issues will become more and more manageable in Taiwan. Our country's vision will focus on the probabilities to become one of the Contracting Parties to the Ramsar Convention, and our important wetlands will be listed as ones of the Ramsar's Sites, which will be designated in the Ramsar's List of Wetlands of International Importance.





1760

1890

**Ancient Maps in Tainan Coastal Wetland
History of the Wetland of International Importance**

HISTORY OF THE WETLAND OF INTERNATIONAL IMPORTANCE



Chigu lagoon

1926

1956

1973

2003

81% of lagoon

Source: Fang, 2009.

Habitat Creation for Ecopia

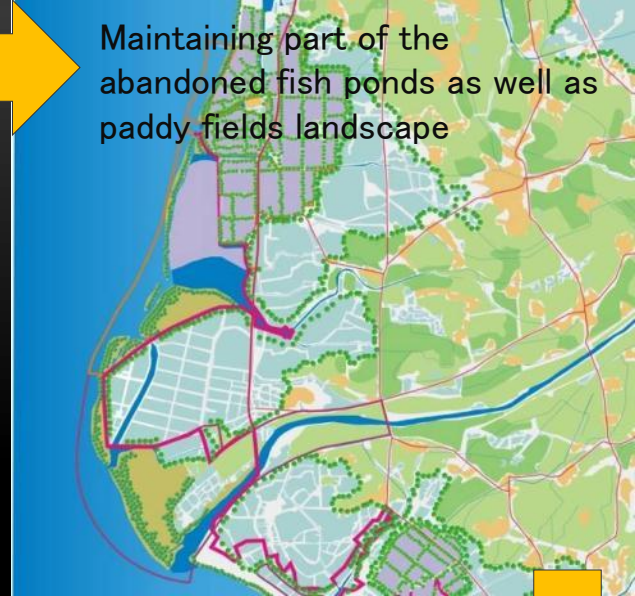




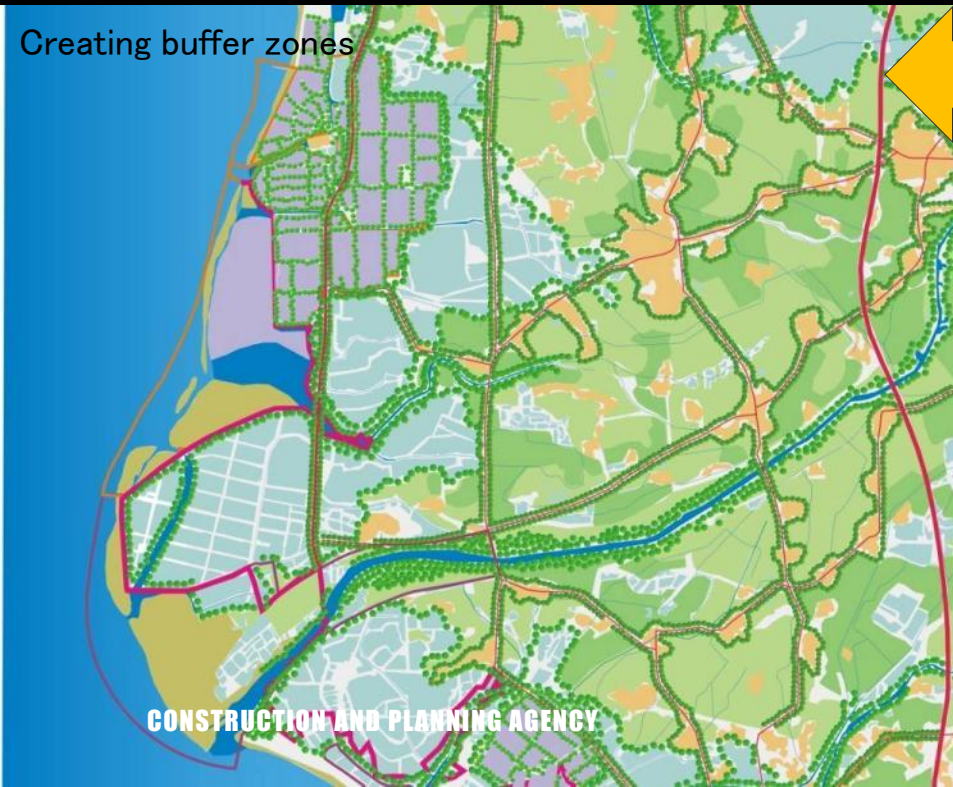
Restoring windbreak



Maintaining part of the abandoned fish ponds as well as paddy fields landscape



Creating buffer zones



Restoring riparian areas as functional corridors



LAND FORMING & WATER-LEVEL CONTROL



HEATHLAND RESTORATION



Oyster farming in Chigu lagoon



Rafting



Oyster farming



Net-sets for farming



Fishmen return

Oyster farming in Chigu lagoon



High-tide returns



Full harvest



High-tide returns

Wetland's Industries in Taiwan



Ecotourism



Bamboo trails



Milkfish



GROUPEP INSTEAD?

Economic Species vs. Non-economic species

Winner



USD 13 per kilogram

**Biggest
Loser**



Loser



USD 3 per kilogram

All ponds have been deepened for the harvest of groupers instead of milkfish for the Economic Cooperation Framework Agreement (ECFA) between Taiwan and China.

Black-faced spoonbills have become the biggest losers since they can not be attracted for deeper waters since 2011.

Wetland's Environmental Friendly Industries in Taiwan

Subsidy for fishermen for canned milkfish.

**Allowed then to use trademark from symbolic
image of Black-faced Spoonbill from National Park.**



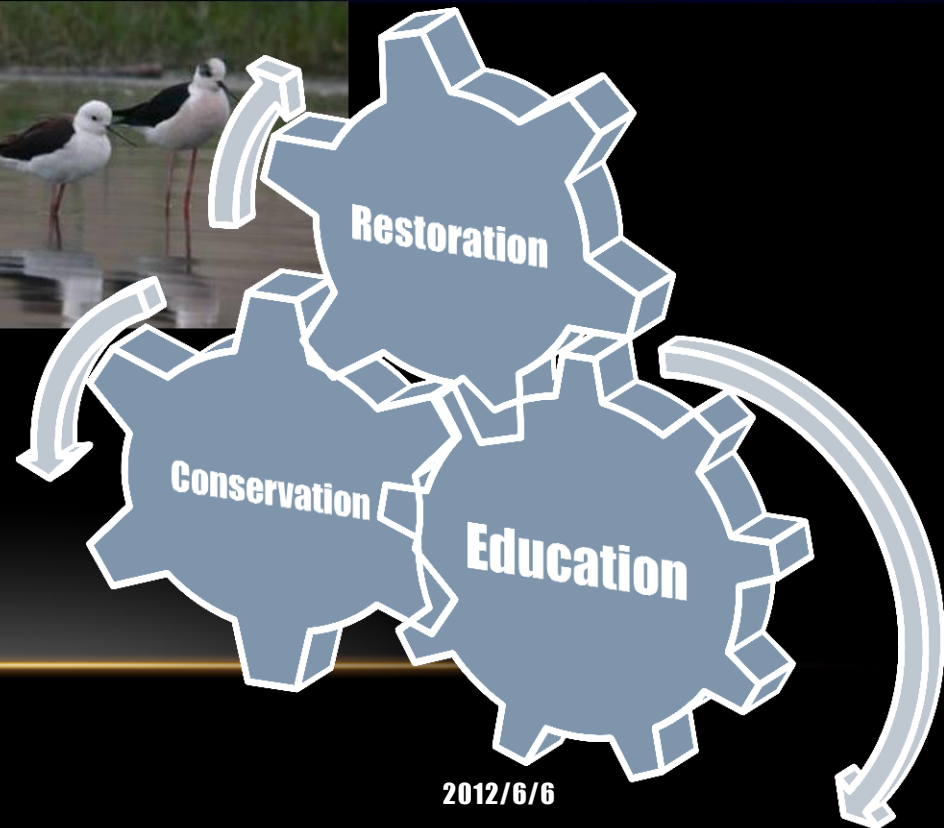




Planning Process is the Purpose



How to develop a proper method for evaluating urbanization issues seems crucial in urban and exurban planning.



From SWS Supporting

Dr. Ben LePage 、 Dr. Rob McInnes 、 Prof. Marinus Otte from SWS



From SWS Supporting

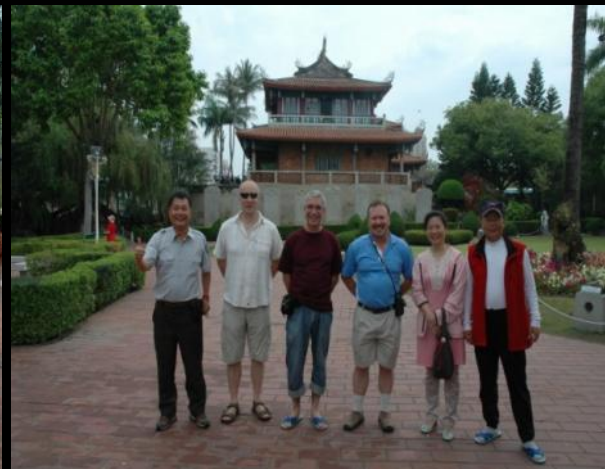
**Dr. Ben LePage talked Wetland Planning, Design, and Construction
During April, 2012**



From SWS Supporting



From SWS Supporting



From SWS Supporting

Lecture by Prof. Marinus Otte



Supported from subsidies, local governments, NGOs, communities, and research institutions acted as the main units who have involved all activities, such as: joint-patrol organization, ecological survey, landscape restoration, etc.



CREATING WIN-WIN FOR?

**The Answer is:
For Our Next Generation
Thanks for your attention**



Patch Demands

