



REVERSING ENVIRONMENTAL DEGRADATION TRENDS  
IN THE SOUTH CHINA SEA AND GULF OF THAILAND  
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The challenge in 1999 was that the only economic "ecosystem values" readily available were those of Costanza *et al.*

The Project Steering Committee composed of participating government representatives, in approving the draft SAP and SCS GEF Project insisted that the project up-date the SAP and determine ***regionally applicable values*** for environmental goods and services.

The SCS Project established in 2003 a Regional Task Force of nine economists charged with this task which was completed successfully in March 2007.



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# **1. Identifying the goods and 'services'**

**- biologists, fisheries scientists, foresters**

# **2. Assemble and evaluate empirical data for economic values of goods and 'services'**

**- economists**

# **3. Standardise the data from seven countries:**

**Across years – Consumer Price Index**

**Across Currencies – US dollar**

## **Output:**

**Annual production and 'service' values in US dollars,  
per hectare, per annum**



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**Problem:** 'Farm gate' prices for environmental goods vary within countries reflecting both the local supply and the demand

**Solution:** Weight individual values according to the stock or area

***Weighted Mean National Value***

The summation of each price (value) multiplied by the stock to which it relates; divided by the total stock for which prices were available in the country



## WEIGHTED MEAN REGIONAL VALUE

$RvA_1Kg =$

$$[(S_{Ca} * MV_{Ca}) + (S_{Chi} * MV_{Chi}) + (S_{In} * MV_{In}) + (S_{Ma} * MV_{Ma}) + (S_{Ph} * MV_{Ph}) + (S_{Th} * MV_{Th}) + (S_{Vi} * MV_{Vi})]$$

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$$(S_{Ca} + S_{Chi} + S_{In} + S_{Ma} + S_{Ph} + S_{Th} + S_{Vi})$$

$S_{Ca}$  = Stock in Cambodia

$MV_{Ca}$  = Standard Mean Value in Cambodia



# Tabulate Weighted National & Regional Mean Values DIRECT USES

Mangrove Goods	Cambodia	China	Indonesia	▶ 7 countries
Timber	779.95	137.07	73.55	
Firewood	17.35	0.00	65.06	
Poles	0.00	0.00	0.00	
Charcoal	71.39	0.00	15.85	
Leaves/palm fronds (Thatch, fodder)	13.66	0.00	0.00	
Fruit/propagules	0.00	100.78	0.00	
▶ 24 goods				
Weighted National Mean Value	$\sum_{Ca}$	$\sum_{Chi}$	$\sum_{In}$	



# Tabulate Weighted National & Regional Mean Values SERVICES – INDIRECT AND NON-USE VALUES

Mangrove Services Cambodia China Indonesia ► 7 countries

Ecotourism	0.00	0.00	59.79
Nursery Function	0.00	1,274.00	782.00
Coastal Protection	0.00	1,044.00	421.56
Aesthetic Value	0.00	1,867.00	0.00

## ► 9 “services”

Weighted National

Mean Value

$$\sum C_a$$

$$\sum C_{hi}$$

$$\sum I_n$$



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## **Total Economic Value**

of the habitats bordering the South China Sea is the summation of the regionally weighted values of the annual production of goods and 'services' per hectare.

## **Total Economic Value for the entire area of each habitat**

is the product of this value multiplied by the total area of the habitat bordering the South China Sea.



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## VALUE OF ANNUAL PRODUCTION IN THE SOUTH CHINA SEA

	Area ha	US\$/ha	Total US\$
Mangroves	1,799,136	2,872	5,167,568,376
Coral reefs	750,307	1,542	1,157,393,566
Seagrass	73,769	1,181	87,164,713



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- **Regional Working Groups**

Identified regional level actions to ensure co-ordination of national level actions in the implementation of the Strategic Action Programme.

Estimated the costs based upon experiences with the implementation of the SCS Project

**COSTS DO NOT INCLUDE** the costs of actions in the National Action Plans that contribute towards the achievement of the regional targets of the Strategic Action Programme (SAP).

If the environmental targets of the SAP are met then various economic benefits might be gained in terms of the avoidance of economic losses consequent upon the loss and degradation of coastal habitats.



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## **SAP COSTS COMPARED WITH VALUE OF ANNUAL PRODUCTION SAVED**

- Mangroves 2.99 million US dollars compared with 5.1 billion US dollars of annual production;
- Coral reefs 3.96 million US dollars compared with 1.1 billion US dollars of annual production;
- Seagrass 1.58 million US dollars compared with 87.2 million US dollars of annual production;
- Wetlands 5.99 million US dollars compared with 1.2 billion dollars of annual production.



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# COSTS AND BENEFITS OF MANGROVE INTERVENTIONS IN THE SAP [FIRST FIVE YEARS]

- **Costs 2007 values** 2,994,073
- **Benefits 2007 values** 1,479,382,085
- **Net Benefits** 1,476,388,012