

The background of the slide features a lush green mangrove forest. A prominent blue arch is superimposed over the top half of the image. Two horizontal green bars are positioned above the arch. The text is centered within the light green area.

JICA Mangrove Project in Bali

Concepts, activities, outputs and
perspectives

History and Perspectives

The Development of Sustainable Mangrove Management Project

(1992 – 1999)

Data Collection
Development of Techniques

Materials

“Nursery Manual”
“Silviculture Manual”
“Management Models”
“Mangrove Handbook”

The Mangrove Information Centre Project

(2001 – 2006)

Distribution of Knowledge
Institutional Strengthening

Methods

Training Courses
Environmental Education
Information Management
Eco-tourism

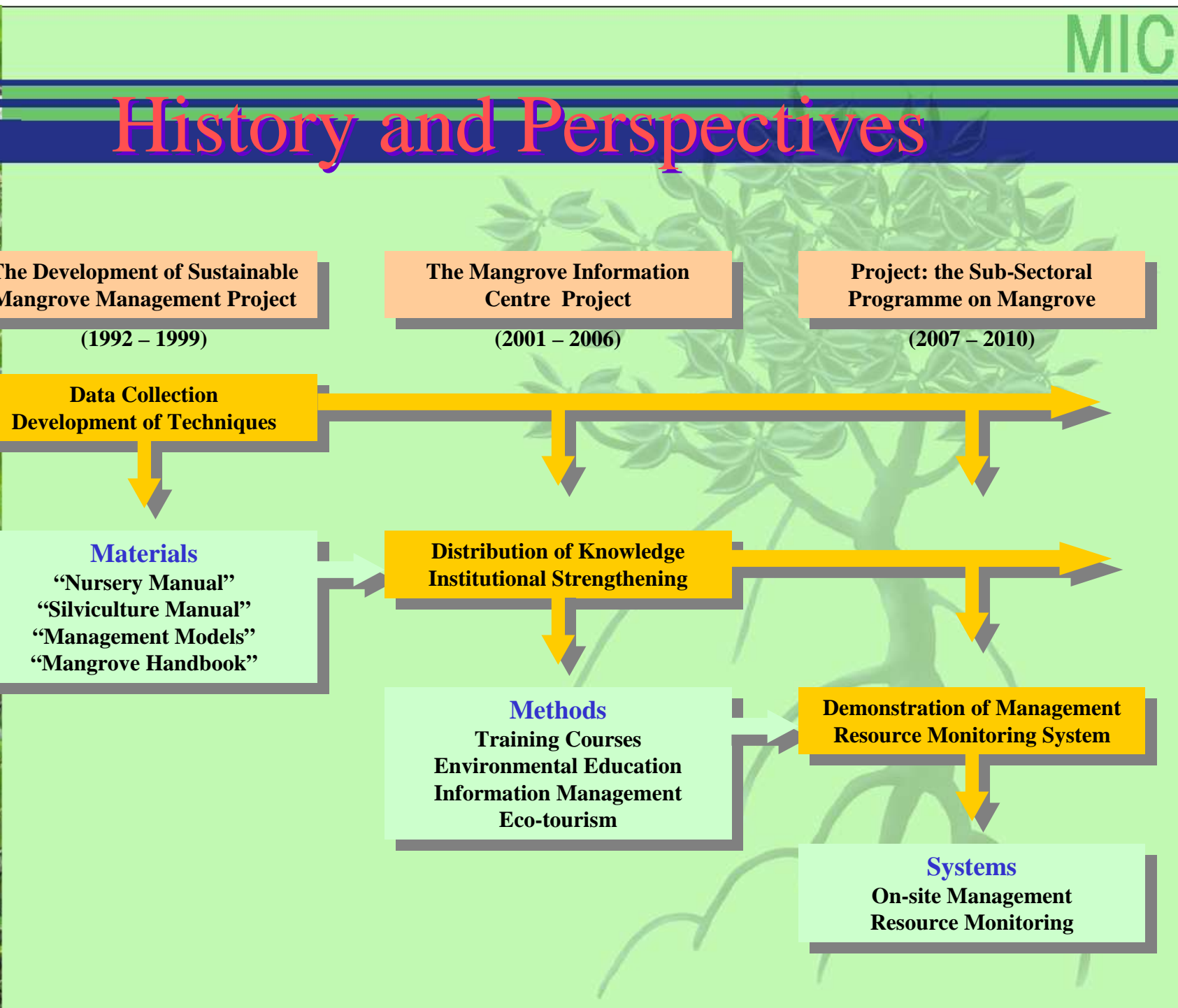
Project: the Sub-Sectoral Programme on Mangrove

(2007 – 2010)

Demonstration of Management
Resource Monitoring System

Systems

On-site Management
Resource Monitoring



The Mangrove Information Centre Project

Main Phase: May 2001 – May 2004
Follow-up Phase: May 2004 – May 2006

Overall Goal

Extension on sustainable mangrove management is implemented nationwide.

Project Purpose

The MIC is institutionally strengthened in terms of ability to conduct;

of Main Phase:
training on sustainable mangrove management.

of Follow-up Phase:
activities, which would contribute to the promotion of sustainable mangrove forest ecosystem management.

Outputs Expected

of Main Phase:

**Training courses on sustainable mangrove management are implemented.
A training programme and an extension strategy for sustainable mangrove management are formulated.**

of Follow-up Phase:

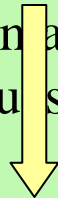
**MIC is institutionalized under the Ministry of Forestry (MOF)'s organization.
MIC holds sufficient number of staffs with abilities in conducting necessary activities for the full operation of MIC.**

The Method & the Concept

The method adopted for achieving the project purpose



On-the Job Training of staffs through various activities for the collection and distribution of information, knowledge and techniques on Mangroves.



Research and Survey



Choice of distribution measures by target based on the concept

Training of Trainers

Environmental Education

Eco-tourism

Socialization

Publication

MIC is institutionally strengthened in terms of ability to conduct activities required

The Method & the Concept



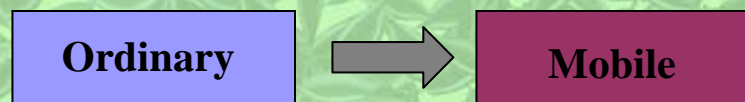
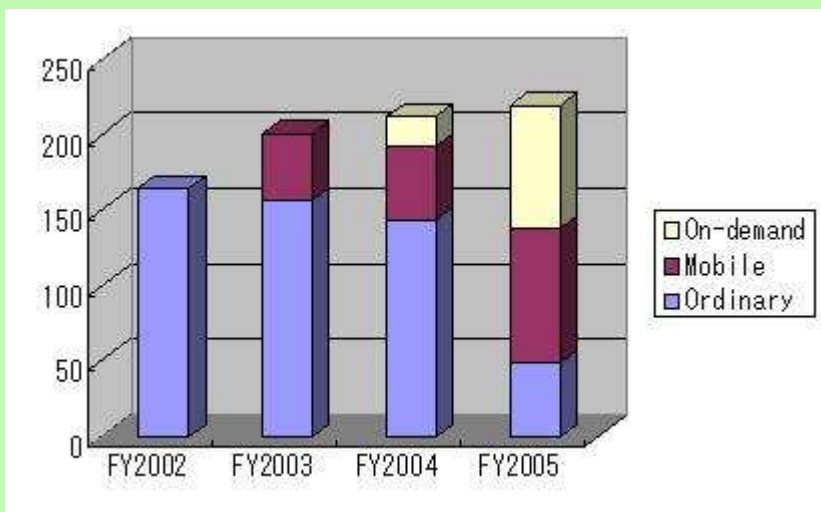
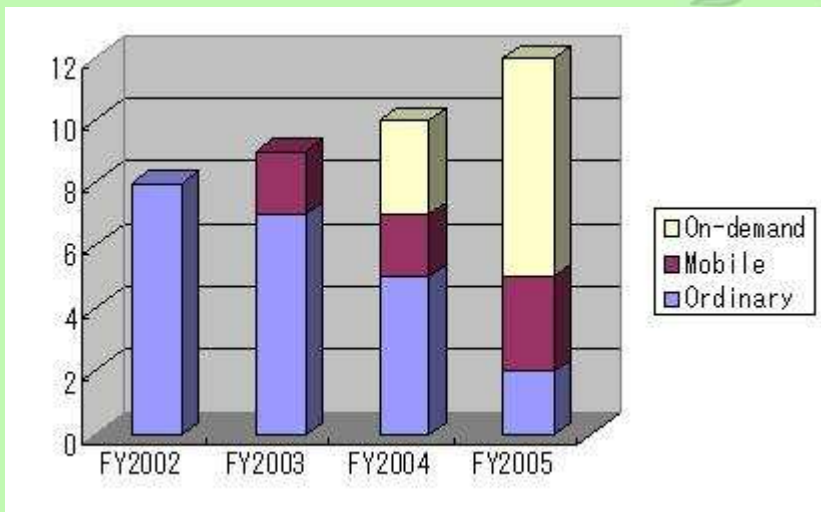
Activities and Outputs

Courses and Events Implemented during the Project Term of Training, Environmental Education and Eco-tourism

	Year	2001	2002	2003	2004	2005	2006	Manuals/Guidelines formulated
	Month	May-Dec.	Jan.-Dec.	Jan.-Dec.	Jan.-Dec.	Jan.-Dec.	Jan.-Apr.	
Ordinary Training	Times		6	7	6	1	1	Training Programme (2004) Training Operation Manual (2004)
	Participants		134	151	163	30	18	
Mobile Training	Times			2		5		
	Participants			44		139		
On-demand Training	Times				2	7	1	
	Participants				15	73	12	
Class-in-the Field	Times	2	1	13	62	88	28	Environmental Education Programme (2004)
	Participants	60	40	566	3,752	6,012	1,610	
Env.Edu. Events	Times	1	2	4	5	4		
	Participants	150	100	570	406	650		
Volunteer Plantation	Times	11	17	13	28	32	9	Silviculture Manual (1999) Nursery Manual (1999)
	Participants	2,325	1,971	1,988	3,378	5,414	1,358	
Eco-tours	Times				119	102	19	Eco-tour Guide Manual (2004) MIC Eco-tour Plan (2004)
	Participants				327	355	78	

Evaluation

of Training Activities



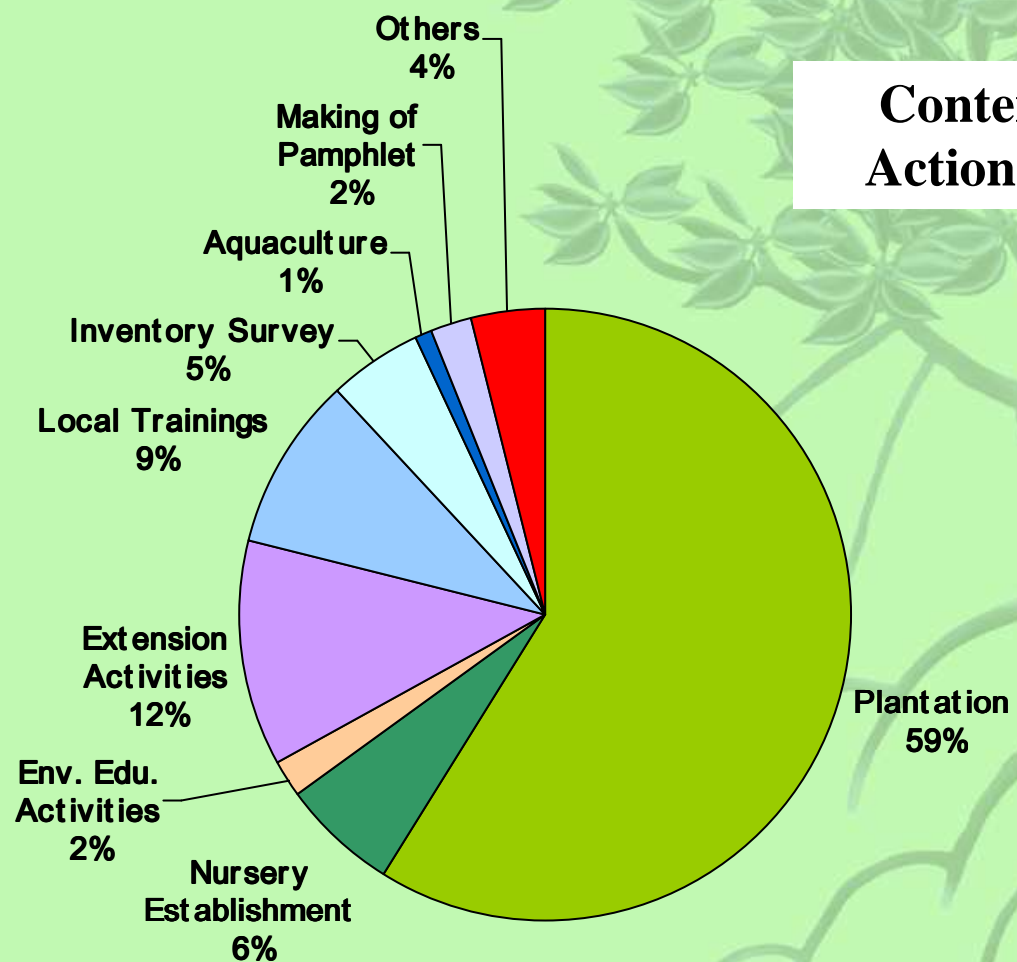
Specialization of Training Contents



Sustainability

Evaluation

of Action Plan by Trainees

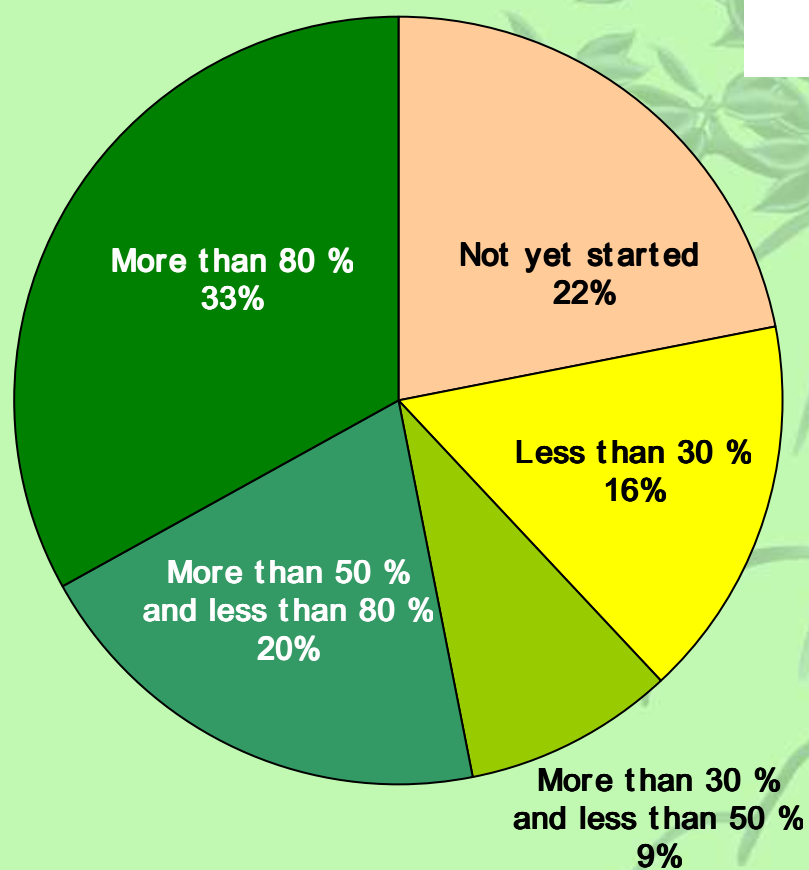


**Contents of
Action Plans**

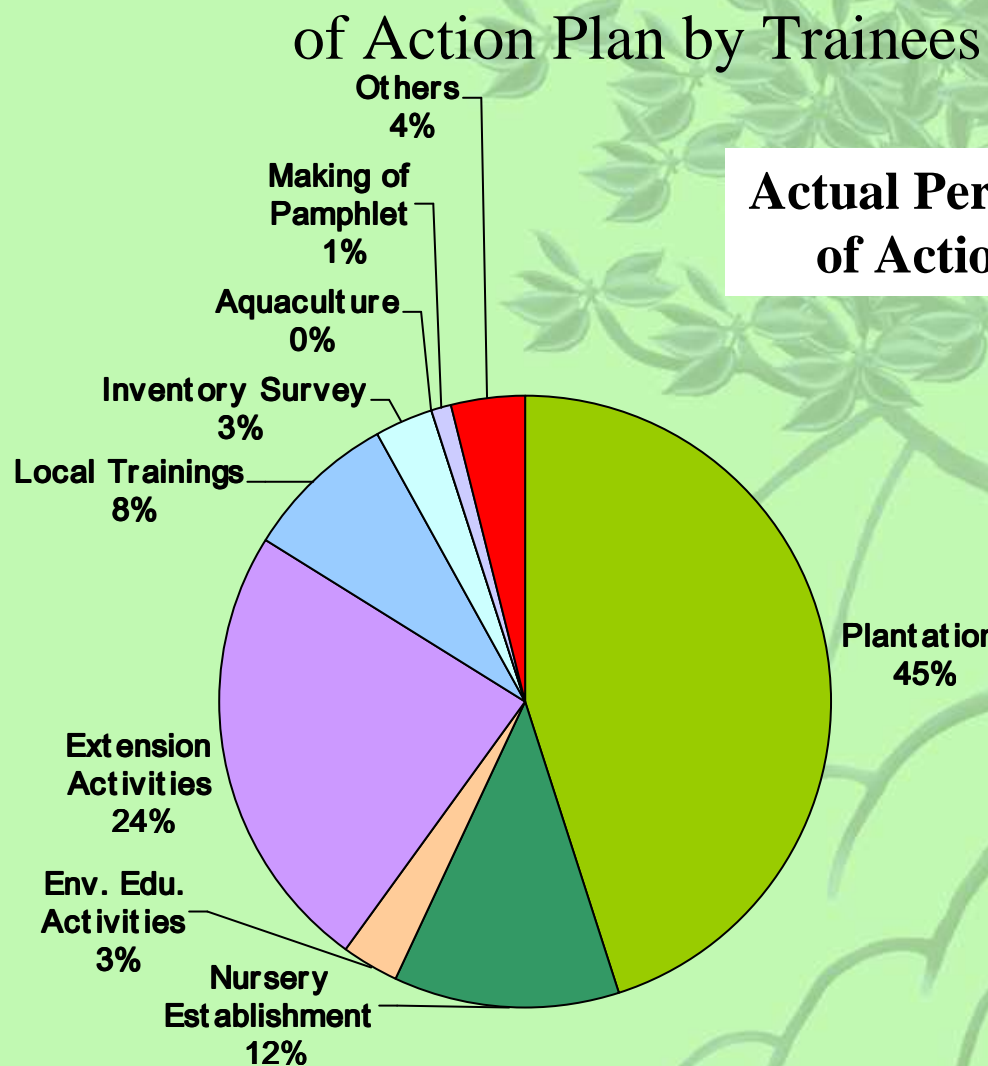
Evaluation

of Action Plan by Trainees

Achievements of Action Plans



Evaluation



**Actual Performances
of Action Plans**

Evaluation

of Action Plan by Trainees

	Province	No. of Trainees	A	B	C
Sumatera	Nanggroe Aceh	97		5	10
	N. Sumatera	9			
	Riau	29	450		
	W. Sumatera	3			
	Jambi	6			
	S. Sumatera	9	75		
	Bengkulu	7			
	Lampung	12	100	520	
	B. Belitung	6	1		
Java/Bali	W. Java	22	62		
	Banten	5			
	JKT	8	210		
	C. Java	25	543	15	
	Yogyakarta	2			
	E. Java	53	301	145	
	Bali	38			8

	Province	No. of Trainees	A	B	C
Kalimantan	E. Kalimantan	33			
	W. Kalimantan	7			
	C. Kalimantan	1	20		
	S. Kalimantan	13	1	250	
Sulawesi	N. Sulawesi	25			
	Gorontalo	2	10		
	C. Sulawesi	8	120		
	S. Sulawesi	23	20		
	SE. Sulawesi	29			
NT	NTB	29	2		
	NTT	33	45		
Maluku/Papua	Maluku	2			
	N. Maluku	4			
	W. Irian Jaya	5			
	C. Irian Jaya	1	15		
	E. Irian Jaya	3	4		

Rehabilitated Area of Mangrove Based on Action Plans = c. 3,000ha

Evaluation

Total Input for 5 years
(Japanese Side only)

JY 450,000,000

It is equivalent to about JY 3 per capita of Japan

Total Outputs for 5 years

→ **Outputs with economically inconvertible value**

779 trainees of training courses for the sustainable mangrove management

More than 30,000 participants of environmental education activities and events incl. volunteer plantations

Manuals /guidelines for training, environmental education and eco-tourism activities

Human resource development for MIC staffs

Institutionalization of MIC with appropriate facilities

→ **Outputs with economically convertible value**

About 3,000 ha of rehabilitated mangroves = JY 9,000,000,000/year

(Supposing public benefits of forest = JY 3,000,000/ha/year)

It is equivalent to about JY 1.5 per capita of the world

Evaluation

Rehabilitated area of mangroves as outputs of the Project

$$3,000 \text{ ha} \times 50 \text{ t/ha} = 150,000 \text{ t / year}$$

It is equivalent to about 0.01 % of total annual emission of greenhouse gas in Japan

Degraded / deforested mangrove area to be rehabilitated in Indonesia

$$2,000,000 \text{ ha} \times 50 \text{ t/ha} = 100,000,000 \text{ t / year}$$

It is equivalent to about 7 % of total annual emission of greenhouse gas in Japan

Carbon-dioxide Fixation Ability of Mangrove Species as an Example of Numerical Value Estimation

Species	Carbon-dioxide Fixation (t/ha/yr)	Oxygen Emission(t/ha/yr)
<i>Avicennia marina</i>	46.81	33.75
<i>Avicennia alba</i>	39.31	25.55
<i>Bruguiera gymnorrhiza</i>	21.19	15.44
<i>Ceriops tagal</i>	18.06	13.13
<i>Rhizophora apiculata</i>	38.86	27.19
<i>Rhizophora mucronata</i>	58.38	42.44
<i>Xylocarpus granatum</i>	25.87	18.63

Source: Professor Sanit Aksornkoae