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Asian Network of Algae as
Mitigation & Adaption Measures

ASIAN NETWORK FOR USING ALGAE AS A CO_2 SINK

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Asian Network For Using Algae As A CO_2 Sink

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Secretary

The Asian Network for Using Algae as a CO_2 Sink
Asian Pacific Phycological Association

APPA Working Group - Network

Nov, 2005

4th Asian Pacific
Phycological Forum
Rama Garden Hotel
Bangkok
Thailand

Agenda 21 for Green Paths to the Future

Members

Asian Network
for Using Algae As A CO_2 Sink

WHAT IS TO BE DONE

Publications

1. A comprehensive summary and critical analysis of the magnitude of current CO_2 sequestration by seaweeds and how this compares with current emissions is required.
2. CO_2 budget of the seas: removal/sequestration of carbon through algal photosynthesis or the CO_2 absorption capacity of various algal species, including an estimate of the carbon uptake rates by coral-associated algae
3. Comparison of CO_2 sequestration by algae with CO_2 sequestration by land forest
4. Baseline information on atmospheric CO_2 levels on a regional/country basis

Network Activities

1. Working Group members encourage their government agencies and algal industries to promote policies that are effective in pollution abatement as well as environmentally sound.
2. Working Group members and their respective governments should take initiatives on the potential use of algae to stabilize CO_2 levels by 2012, as recommended by the Kyoto Protocol.
3. A database on the various aspects of carbon sequestration using algae should be developed and made accessible to the various members.
4. Regular international meetings and workshops will be convened to discuss the importance of algae as natural CO_2 scavengers and to promote a scientific c program for capacity-building and international cooperation.
5. Regular reports and proceedings will be prepared by the WG of the Asian Network for using Algae as a CO_2 Sink.
6. The number of participating member countries of the Asian Network for Using Algae as a CO_2 Sink will be expanded.

Research & Development

1. Appraisal of the achievable growth rates of a wider range of algal species in order to identify the species of high CO_2-sink potential
2. Survey and exploitation of algae in a wider range of species that show a high CO2-sequestration potential
3. Determination of algal performance according to critical environmental factors in global warming such as CO_2 availability, pH and temperature
4. Determination of the time for turnover/growth of algae to a harvestable size to predict how much sea space would be required for enhanced production
5. Appraisal of seasonal variation in growth rates of algae of high CO_2-sequestration potential to determine possible temporal fluctuations in CO_2-sink activity
6. Research into means of maximizing growth rates/yields, per unit area of sea surface, of algae of high CO_2-sequestration potential
7. Development of an algal cultivation strategy to enhance biomass production and at the same time to maintain a sound and sustainable marine environment
8. Research to determine the best yields in fermentation/anaerobic digestion (ethanol, biogas) or lipid content (biodiesel) of algae of high CO_2-sequestration potential

APPA Working Group - Network

Greenhouse Gas Removal by Seaweed

THE ASIAN NETWORK
FOR USING ALGAE AS A CO_2 SINK
THE ASIAN PACIFIC PHYCOLOGICAL ASSOCIATION

Asian Network
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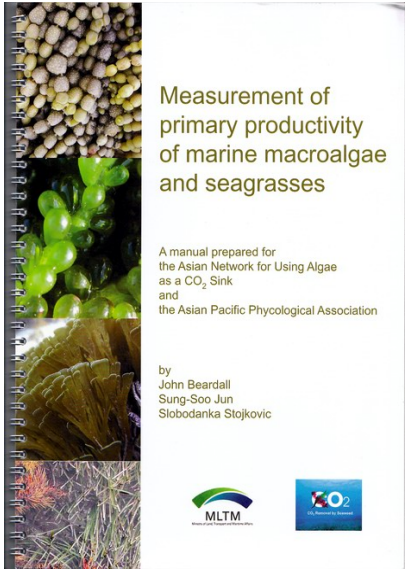

1st hands-on workshop on the measurement of primary productivity of marine macroalgae and seagrasses for the Asian Network for Using Algae as a CO_2 Sink and APPA was held at Rutherford House, Victoria University, Wellington, New Zealand, during the 5th APPF, November 10-14, 2008

Asian Network
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ASIAN NETWORK
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THE ASIA-PACIFIC PHYCOLOGICAL ASSOCIATION
Newsletter


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Events (Bali, Indonesia : Dec 3-14, 2007)

The 3rd APPA WG Network Meeting
Bali, Indonesia

Side Event
Seaweed:
Coastal CO_2 Removal Belt in Korea
& The Asian Network for Using Algae as a CO_2 Sink

COP-13
UNFCCC

UN Climate Change Conference 2007
Bali - Indonesia

Asian Network
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COPs of UNFCCC

What's next step?

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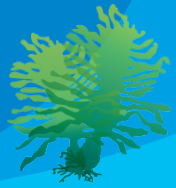
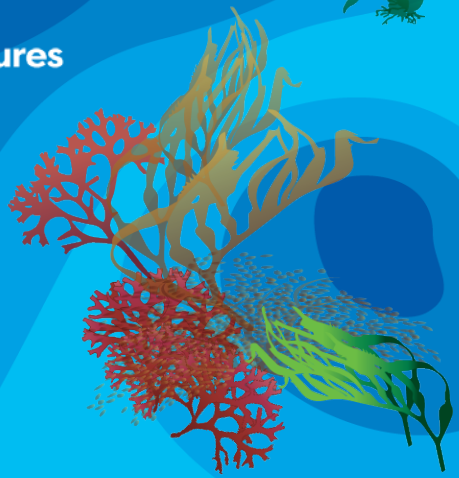
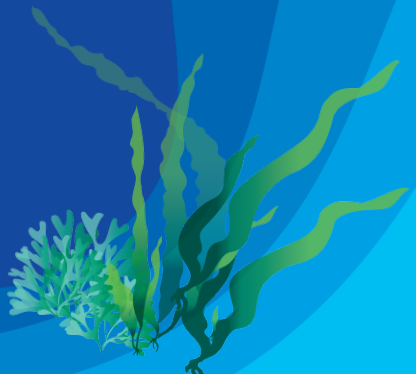
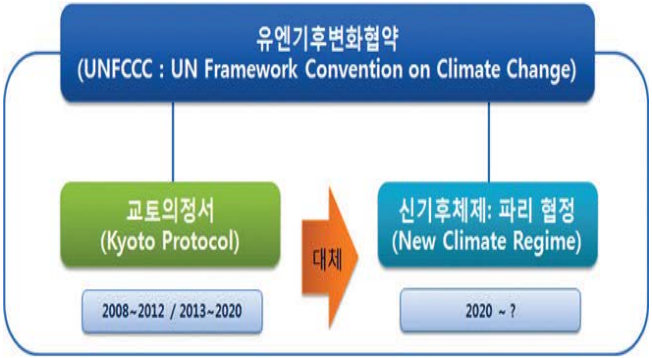








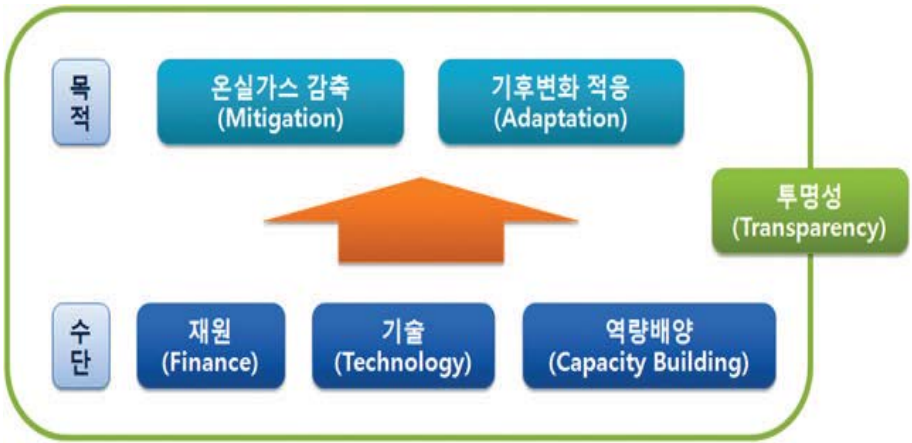
ADOPTION OF THE PARIS AGREEMENT (2015)

- Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels
- Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development
- Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.

DECISIONS TO GIVE EFFECT TO THE PARIS AGREEMENT

- Mitigation /INDC (Intended Nationally Determined Contribution; 5 yrs
- Adaptation
- Loss and Damage the Warsaw International Mechanism
- Climate Finance
- Technology Development and Transfer
- Capacity Building
- Transparency of Action and support
- Global Stocktake
- Facilitating Implementation and Compliance

A historic agreement !
A landmark achievement !



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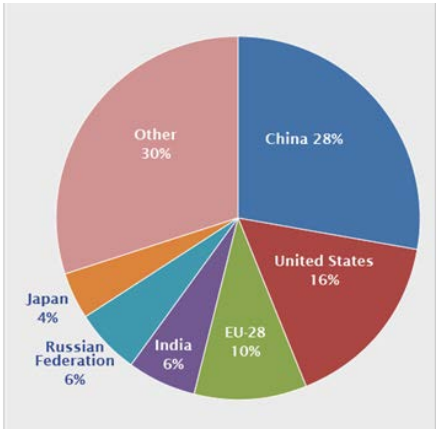
PARIS AGREEMENT & ADAPTATION, Article 7

1. Parties hereby establish the global goal on adaptation of enhancing adaptive capacity, **strengthening resilience and reducing vulnerability** to climate change, with a view to contributing to sustainable development and ensuring an adequate adaptation response in the context of the temperature goal referred to in Article 2.

Adaptation: The introduction of programs, policies, measures, or actions of governments, corporations, individuals, or other entities, in order to prevent or minimize, or to beneficially utilize the impacts of climate change. Successful adaptation strategies and measures result in societies that are more resilient and less vulnerable.

Adaptation measures are designed based on the following concepts.
Risk avoidance: **Reduction of negative impacts**: **Risk sharing**:
Risk acceptance: **Exploitation of opportunities**



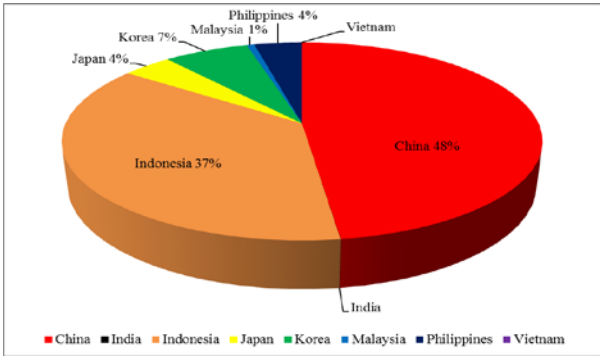
- This marks a new path for our planet…we have reached an agreement that will help the world transition to a global low-carbon economy… **(US)**
- This is a transformational agreement, a triumph of multilateralism **(Morocco)**
- This is a marvelous action, balancing world interests with national interests **(China)**
- The agreement represents a new chapter of hope, and we should care for the world we will not see **(India)**
- For the first time, the interests of the small island developing states (SIDS) were taken into account…and the goal of 1.5 C will keep us alive… **(St Lucia, on behalf of the Caribbean states)**.

BLUE CARBON

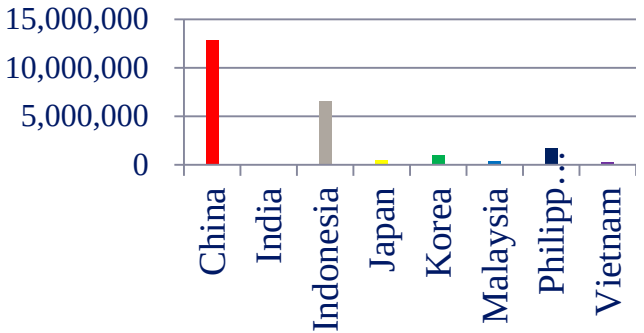
Coastal Marine Ecosystems : Missing Carbon Sinks

Asia

- Water stress will affect many millions of people in Central, South, East and South-East Asia, particularly along the large river basins such as Changing.
- Fish breeding habitats, fish food supply and, ultimately, the abundance of fish populations in Asian waters will be substantially altered. Aquaculture industry and infrastructure, particularly in heavily populated mega deltas, are likely to be seriously affected by coastal inundation. Climate change will become the main driver of change around 2050 and until then will act mainly to exacerbate other drivers.
- South-East Asia is increasingly vulnerable to slow on-set changes; the region suffers from sea level rise, ocean warming and acidification, but also from sudden impacts such as increased frequency and intensity of cyclones and heat waves.
- Fisheries and aquaculture are at great risk, particularly in the highly vulnerable river deltas, where they are exposed to sea level rise, erosion and saltwater intrusion. Ocean's warming and acidification and decreased availability of dissolved oxygen will lead to a decrease in the average body size of ocean fish, as well as result in more severe and frequent coral bleaching episodes. Global ocean fish production is projected to decrease by 20% by the end of the century. The aquaculture sector will also suffer from climate change challenges, such as increased temperature, salinity and frequency of extreme events.
- Coastal communities involved in fishing and fish farming are and will be increasingly impacted by more frequent cyclones and storms, sea level rise and associated saline ingress.
- With its very high density of population and high levels of poverty, South Asia is among the most vulnerable regions with regard to climate change impacts. It is anticipated that the region will be exposed to more frequent and extreme heat, increasingly irregular and intense rainfalls, with an increase of up to 40 per cent in annual precipitations in a +4°C world but also an increased number of dry days and glacier melting in the Himalayas. The presence of large deltas also makes South Asia particularly vulnerable to sea level rise.



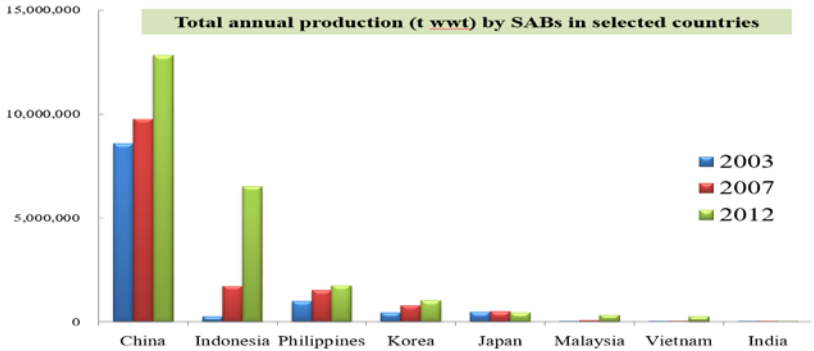
Algae Harvested (t wwt yr^{-1})



Production market Value USD

TOTAL : 8,428,696,526 USD

FAO (2014) Country Reports, APPA-Asian Network (2014)



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This work has been supported by the National Research Foundation of Korea, Marine Research Institute, Pusan National University (NRF-2013R1A1A2009359) and DIKTI Scholarship from Indonesia Ministry of National Education and Culture for CFAS.

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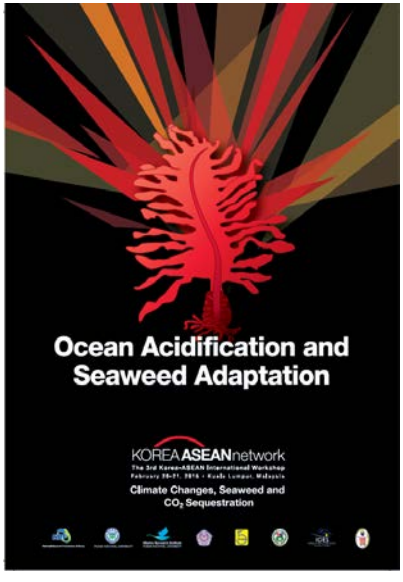

The 3rd Korea-ASEAN International Workshop - Climate Changes, Seaweed and CO_2 Sequestration

Ocean Acidification and Seaweed Adaptation

February 20-21, 2016
Kuala Lumpur, Malaysia

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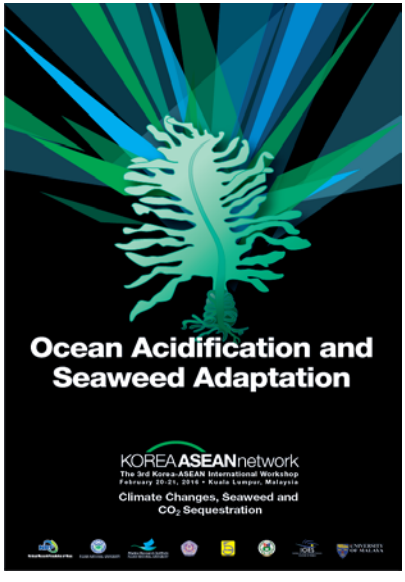

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ANAMAM: Plan

We need to list up the tasks to be performed by the Asian Network of Algae as Mitigation and Adaptation Measures (ANAMAM).

The network workshops on “The Sustainable Seaweed Industry for Blue Carbon”, held at Wando Seaweed Expo, Korea, April 15, 2017.

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thank YOU