Economic Impacts and Effective Measures against Harmful Algal Blooms in the NOWPAP region

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Informed Report on Harmful Algal Blooms for the NOWPAP Region

Published in 2011
- Information on HAB monitoring
- Number of HAB occurrences

HAB occurrence in the NOWPAP member states
Negative impacts of HABs

Damage

Fisheries/Aquaculture

Human health

Tourism
Total economic loss in fisheries from 2006 to 2012: US$ 94 million

* From 2006, the number in Japan includes events in the Ariake Sea.
Huge economic losses in fisheries in recent years

Yatsushiro Sea in 2009 and 2010
Economic loss by *Chattonella antiqua*:
- US$3.3 billion in 2009
- US$5.4 billion in 2010

South Gyeongsang Province in 2013
Economic loss:
- US$10 million by Aug.
- US$28 million by Oct.?
(Source: *The Korean Times*, 5 and 10-11 Aug. 2013)
Damage to tourism

Massive blooms of green macroalgae in China

US$ 30 million for cleanup cost and US$ 100 million in fisheries losses

New York Times, 6 July 2013
Mitigation against negative impacts of red tide

Damage

Fisheries

Human health

Tourism

Countermeasures

Good practices for reduction of economic loss in fisheries
Regular monitoring and warning system in China

Best Practice 1: Regular monitoring in coastal area
(Fujian Province and Zhejiang Province in China)

Regular monitoring (2001) → Forecasting system → Early detection → Reducing economic loss in coastal area

90 million Chinese Yen (US$14.7 million) in 2002

J.people.com
Prediction/early detection of red tide in Japan

Best Practice 2: Local Information and Communication Technology
(Ainan Town, Ehime Prefecture, Japan)

Fisheries cooperative
Fishermen
University
Local Fishery agency

Outcomes:
- Increased number of early detection of red tide: 71 to 181
- Reduced economic loss: US$35,000/year to 0

Portal website on coastal environment
(Temp., Salinity, DO, HAB occurrence)

System development: US$47,000
Operational cost: US$4,500/year

Developed by Ehime Univ.

Cost-effectiveness
Best Practice 3: Early detection and prediction of red tide movement using remote sensing techniques

(Oita Prefecture, Japan)

Early detection

Prediction of movement

In-situ observation

Satellite images

Loss in Fisheries (million US$)

Oita Pref. Agri. Forest. Fish. Res. Center
Preventive measures in Japan

Best Practice 4: Evacuation map of fish cage
(Ehime Prefecture, Japan)

- Red-tide prone sea area
- Sea area where red tide occurs by certain conditions
- No red tide-prone sea area
- Sea area where is recognized as no evacuation site

Fisheries Division, Ehime Prefecture

Karenia mikimotoi

Out: Naval Security Bureau Ocean Information Department; Collection: Ehime Prefecture Fisheries Division
Thank you

Fruitful partnership