

## **Annex VIII**

### **Workplan and Budget for NOWPAP WG3 (HAB)**

#### **1. Review of Objectives of WG3**

- The goal of NOWPAP WG3 is to develop the capability to provide policy makers with necessary information on HAB. WG3 will accumulate and distribute knowledge on HAB and will set a goal on the development of collaborative monitoring programme on HAB in the NOWPAP region.

- The objectives of WG3 are (1) to propose activities to cope with the HAB problems, (2) to collect information to realize the proposed activities, (3) and to carry out necessary analyses of collected information to make policies for mitigation to HAB.

- CEARAC will facilitate the regional monitoring and mitigation activities through the formation of the common understanding on HAB, provision of scientific data for HAB analysis, and dissemination of information on HAB studies. These activities will be realized as the collaborative HAB monitoring and proper mitigation measures in this region.

#### **2. Review of Workplan for Working Group 3**

##### **Phase 1: Construction of a framework for WG3 activities for HABs in the NOWPAP Region (in 2002 and 2003 )**

In order to make a plan for WG3 activities and hold FPM, CEARAC collected basic information on HABs and asked the WG3 expert to make status reports on HABs in 2002. Based on general preparation in 2002, CEARAC held the 1<sup>st</sup> FPM in March 2003, in Toyama, Japan and discussed activities for WG3. In response to the result of the 1<sup>st</sup> FPM, the 1<sup>st</sup> WG3 Meeting was held in October 2003, in Busan, the Republic of Korea ,and the meeting proposed a workplan for WG3 activities. WG3 agreed three concrete activities, which were (1) to compile reports (National Reports and Integrated Report) on HABs in the NOWPAP Region;, (2) to establish the HAB Reference Database; and (3) to conduct *Cochlodinium* Corresponding Group (CCG). The purposes of these activities were to understand the situation of HABs in the NOWPAP Region and share the information about HABs among the NOWPAP Members (China, Japan, Korea, and Russia). Especially, WG3 took *Cochlodinium*, one of the most concerned species, as a target species to collect information on this species intensively in cooperation with the NOWPAP Members.

It can be said that the basic framework for WG3 activities was constructed in Phase 1 (in 2002 and 2003).

**Phase 2: Grasp and dissemination of information on HABs in the NOWPAP Region (in 2004 and 2005)**

A workplan shown in Table 1 and terms of reference (TOR) for WG3 were accepted in the 2<sup>nd</sup> FPM in March 2004. The proposed activities for 2004 were compiling National Reports and establishing HAB Reference Database. In November 2004, the 2<sup>nd</sup> WG3 Meeting was held in Qingdao, the People's Republic of China. In the meeting, the progresses of WG3 activities for 2004 were reported, and the content of Integrated Report was accepted. The meeting also approved the members of CCG and accepted a plan to make *Cochlodinium* Homepage and a pamphlet as the results of CCG activities.

HAB Reference Database is now available on the CEARAC Website and can be used for collecting information on HAB in the NOWPAP Region. National Reports are planned to be published in September 2005. Based on National Reports, Integrated Report is now being made. *Cochlodinium* Homepage will be available in September 2005. This homepage is very unique since the information on the homepage focuses on one red tide species. CEARAC expected to use this information on the HP in case this species spreads in the NOWPAP Region in the future.

In Phase 2(2004 and 2005), the concrete activities of HABs have been conducted. In the activities, CEARAC and WG3 have made National Reports, Integrated Report, HAB Reference Database, a homepage and pamphlets for *Cochlodinium*. Through these activities, CEARAC and WG3 have grasped the situation of HABs in this region and disseminate information to the public.

Table 1. Workplan of Working Group 3

	Phase 1		Phase 2		Phase 3	
	2002	2003	2004	2005	2006	2007
CEARAC FPM		(Mar)	(Mar)	(Sep)	(Mar)	(Sep)
WG3 Meeting		(Oct)	(Nov)		(Summer)	
Development of HAB-database		· Collection of information on the scientific publications · Categorization of publications · Questionnaire	· Establishment of HAB Reference Database	· Addition of information from National Reports	· Collection of articles about <i>Cochloacinium</i> and mitigation · Addition of general information	· Collection of articles about <i>Cochloacinium</i> and mitigation · Addition of general information
Identification and prioritization of needs						
Information dissemination			· Newsletter (HAB Reference Database)	· Newsletter	· Newsletter	· Newsletter
Identification and analysis of important scientific				· ( <i>Cochloacinium</i> HP) · ( <i>Cochloacinium</i> Pamphlet)		
Development of collaborative monitoring programme		· Plan of CCG	· Establishment of CCG	· Establishment of <i>Cochloacinium</i> HP · Distribution of Pamphlets	· Survey of prevention, control, and mitigation of <i>Cochloacinium</i>	
Promotion of Mitigation					· Joint Meeting of WG3 and WG4 to discuss collaborate red-tide monitoring program with satellite remote sensing technology	
National Report					· Survey of prevention, control, and mitigation of red-tides	· Issues of "Booklet of Case Studies of Mitigation of Red Tides"
Integrated Report				↑ Issue of National Reports		
				↑ Issue of Integrated Report		

Note: New National Reports and Integrated Report will be prepared in the future, when necessary.

### 3. Workplan for Working Group 3 in 2006 and 2007

#### Phase 3: Promotion of Mitigation of Red Tides for the NOWPAP Region

CEARAC would like to plan activities of WG3 in 2006 and 2007 for “Promotion of Mitigation” of red tides. The plan of the activities for the next two years has been prepared in the basis of suggestions proposed in the Draft Integrated Report and a WG3 workplan approved in the previous FPMs.

Suggestions in the Draft Integrated Report were made according to advices for future activities of WG3, which the NOWPAP Members described in National Reports (See Table 2).

**Table 2 . Activities of WG3 suggested in National Reports**

China	Japan	Korea	Russia
<ul style="list-style-type: none"> <li>➤ Development of common data and information network for HAB monitoring (C1)</li> <li>➤ Cooperation and information exchange with other relevant organizations such as WESTPAC and PICES (C2)</li> </ul>	<ul style="list-style-type: none"> <li>➤ Action against <i>Cochlodinium</i> blooms, through continuation of CCG and organization of joint programs with WESTPAC/TTR (J1)</li> <li>➤ Cooperation with other UNEP Action Plans (e.g. East Asia Sea Action Plan) (J2)</li> <li>➤ Information exchange with other organizations to avoid unnecessary overlaps of activities (J3)</li> <li>➤ Development of appropriate policies and technologies to control inputs of land-based nutrients into the seas of the Region (J4)</li> </ul>	<ul style="list-style-type: none"> <li>➤ Action against <i>Cochlodinium</i> blooms, through continuation of CCG and implementation of collaborative research programs within the NOWPAP Members (K1)</li> <li>➤ Development of appropriate policies and technologies to control inputs of land-based pollutants into the seas of the Region (K2)</li> </ul>	<ul style="list-style-type: none"> <li>➤ Research and analysis of influence of land-based sources of nutrients and pollutants on the HABs issues in coastal zone. (R1)</li> <li>➤ Cooperation and information exchange with other relevant organizations such as WESTPAC and PICES (R2)</li> <li>➤ Continuation of international training programs (R3)</li> </ul>

Those suggestions in the National Reports can be combined into four suggestions ((1) - (4) in Table 3). Suggestion (5) is added as the ultimate goal of WG3, which was set when the WG3 activities started. CEARAC shall continue to exchange information with international organizations and gather the data for HAB Reference Database, which are related to Suggestions (2) and (3) respectively.

**Table 3 . Activities for WG3 suggested in Integrated Report**

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| <ol style="list-style-type: none"><li><b>1 . To facilitate research and study of <i>Cochlodinium</i> through CCG activities, (J1,K1)</b></li><li><b>2 . To cooperate with other international organizations that are involved in HAB (C2,J2,J3, R2, R3)</b></li><li><b>3 . To establish common understanding of HAB through development of a database and information network (C1)</b></li><li><b>4 . To help make a policy on control of land-based nutrients discharge (J4, K2, R1)</b></li><li><b>5 . To seek a collaborative work for HAB monitoring for the NOWPAP Region</b></li></ol> |
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Considering Suggestions (1) and (4) among the five suggestions above, CEARAC has been making a concrete plan to promote mitigation activities against red tides. Collecting information about mitigation measures is one of the important activities of CCG. Integrated Report introduced current mitigation methods to prevent damages caused by *Cochlodinium* red tides and explained necessity of further development of countermeasures for the wider usage for the coastal environment of the NOWPAP Region. Therefore, CEARAC shall collect case studies of countermeasures against not only *Cochlodinium* but also against other red-tide species in order to contribute further development and application of mitigation measures. Suggestion (4) is related to another type of mitigation. That is proactive measure against red-tide by reducing eutrophication level, which is assessed by some environmental parameters such as nitrogen, phosphorus, and COD. NOWPAP Members have experiences to control nutrients loading from land. CEARAC shall also collect information on their proactive measures such as environmental laws and policies.

As shown in Table 1, the activities for "Promotion of Mitigation" have not been started yet because, at first, NOWPAP Members needed to collect basic information about HAB and understand the situation of HABs. Thanks to the efforts of WG3 in the past two years, we will have National Reports, Integrated Report, HAB Reference Database, *Cochlodinium* Homepage and its pamphlet by the end of 2005. CEARAC is now ready to begin an activity for "Promotion of Mitigation". For the next two years of 2006 and 2007, CEARAC and WG3 shall focus on red tide and collect information about both proactive and countermeasures to mitigate damage of red tide in the NOWPAP

Members. As the result of this activity, a booklet of practical experiences and applications of prevention, control, and mitigation of red tide shall be issued at the end of 2007. (See Table 4 and Appendix 8 -1). We expect that this booklet will be used to learn the advantage and disadvantage of mitigation activities and invent better methods and applications to prevent, control, mitigate red tides.

By the 3<sup>rd</sup> WG3 Meeting in summer 2006, a Japanese consultant will make a interim report of case studies of mitigation in Japan.. According to the interim report, WG3 experts collect information and make a report of mitigation done in their own countries with allocation of funds from CEARAC. The fund is paid for not only gathering migration information but also collecting and categorizing reference information for HAB Reference Database. In early 2007, CEARAC will collect report of case studies of mitigation from each country. A consultant hired by CEARAC will make a booklet based on the reports from the NOWPAP Members. The booklet will be issued by the end of 2007.

**Table 4. Workplan for WG3 in 2006 and 2007**

	Phase 3	
	2006	2007
CEARAC FPM	(Mar)	(Sep)
WG3 Meeting	(Summer)	
Development of HAB-database	<ul style="list-style-type: none"> <li>· Collection of article about <i>Cochlodinium</i></li> <li>· Addition of general information</li> </ul>	<ul style="list-style-type: none"> <li>· Collection of article about <i>Cochlodinium</i></li> <li>· Addition of general information</li> </ul>
Information dissemination	<ul style="list-style-type: none"> <li>· Newsletter</li> <li>· (HAB Reference Database)</li> <li>· (<i>Cochlodinium</i> HP)</li> <li>· (<i>Cochlodinium</i> Pamphlet)</li> </ul>	<ul style="list-style-type: none"> <li>· Newsletter</li> <li>· (HAB Reference Database)</li> <li>· (<i>Cochlodinium</i> HP)</li> <li>· (<i>Cochlodinium</i> Pamphlet)</li> </ul>
Identification and analysis of important scientific issue	<ul style="list-style-type: none"> <li>· Survey of prevention, control, and mitigation of <i>Cochlodinium</i></li> </ul>	T.B.D.
Promotion of Mitigation	<ul style="list-style-type: none"> <li>· Survey of prevention, control, and mitigation of red tides (\$14,000)</li> </ul>	<ul style="list-style-type: none"> <li>· Issue of Booklet of Case Studies of Mitigation of Red Tides (\$12,000)</li> </ul>

## **Appendix 8-1 Booklet of Case Studies of Mitigation of Red Tides**

WG3 will collect information about case studies of policies, measures, and techniques to mitigate red tide and make a booklet based on the collected information. WG3 will focus on red tide, not on toxin-producing plankton for this activity, to avoid confusion between red tide and toxin-producing plankton blooms. CEARAC will ask WG3 experts of each country to collect information about case studies of their own countries with funds and hire a Japanese consultant to make a booklet based on the collected information from these experts.

As shown in Table A8-1-1, Chapter 1 introduces case studies of proactive measures such as control of nutrient loadings, improvement of bottom sediment, and making environmental laws. Chapter 2 describes studies of countermeasures and technologies to avoid damages from red-tide. The table of contents proposed here is an example. The contents shall be revised by WG3 experts.

**Table A8-1-1 Provisional Contents of the Booklet of Case Studies of Mitigation of Red Tides**

1. Case Studies of proactive measures to control red tides
1.1 Proactive measures in NOWPAP Members
1.1.1 China
1.1.2 Japan
1.1.2.1 Tokyo Bay
1.1.2.2 Ise Bay
1.1.2.3 Seto Inland Sea (including Osaka Bay )
1.1.2.4 Ariake/Yatsushiro Bay
1.1.2.5 Others
1.1.3 Korea
1.1.4 Russia
1.2 Proactive measures in the World
1.2.1 United States
1.2.1.1 Chesapeake Bay
1.2.2 Mediterranean Sea
2. Case Studies of countermeasures to terminate or mitigate red tides
2.1 Clay Spraying
2.2 Spraying of Chemical Substances
2.3 Biological measures (e.g. bacteria)
2.3 Evacuation techniques of aquacultures
2.4 Others ( Stop of feeding, Nanno-Bubbles, Technique of treatment of Blast water、 Ship for mitigation of red tide, and so on )