



UNITED NATIONS ENVIRONMENT PROGRAMME

***The East Asian Seas Action Plan:
evaluation of its development and achievements***

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1. INTRODUCTION

1.1 This document is an in-depth evaluation of the Action Plan for the Protection and Development of the Marine and Coastal Areas of the East Asian Region, covering the preparatory activities leading to its adoption in 1981, and its subsequent implementation until the end of 1986.

1.2 The following main elements have been used in evaluating the achievements of the action plan:

- (a) changes in national environmental policies and practices (including in national legislation) made either as a direct consequence of the Action Plan adopted in 1981, or in conformity with the objectives of the Action Plan;
- (b) national financial and manpower resources which have been mobilized or used in connection with activities relevant to the Action Plan;
- (c) participation and contribution of national institutions to the implementation of the Action Plan;
- (d) efficiency of training (individual and group training) provided through the Action Plan;
- (e) efficiency of technical meetings held in the framework of the Action Plan;
- (f) role of co-operating agencies and supporting organizations - their substantive and financial contributions to the Action Plan; and
- (g) role of UNEP and of its financial support in the formulation of the Action Plan and its subsequent implementation.

1.3 The achievements were specifically analyzed from the standpoint of how and how much they contributed to the principal objective of the action plan (see paragraph 2.8) adopted five years ago, to the awareness and understanding of environmental issues of the region and to the formulation of national and regional environmental policies of the region.

1.4 The evaluation has been prepared by the secretariat of the action plan (UNEP) on the basis of information available in the files of UNEP and of information supplied by the institutions participating in the action plan (see annex II and IV).

1.5 The preparation of the evaluation has been co-ordinated by the Oceans and Coastal Areas Programme Activity Centre (OCA/PAC) of UNEP. The contributions of Mr. E. Gomez, Mr. A. Dahl and Ms. K. Thomas (consultants to UNEP) to the preparation of the evaluation are gratefully acknowledged.

2. MAJOR STEPS IN THE DEVELOPMENT OF THE ACTION PLAN

2.1 The IOC/FAO/UNEP International Workshop on Marine Pollution in East Asian Waters (Penang, 7-13 April 1976) reviewed the major environmental problems related to marine pollution and identified activities which may contribute to pollution control (EAS-1).^{1/}

2.2 The development of the action plan was agreed by the decision of the fifth session of the Governing Council of UNEP (UNEP/GC/106, annex I, Decision 88(v), section D) in 1977, at the request of the Governments of the East Asian Seas Region.

^{1/} References are to activities described in annex I of this document.

2.3 The ASEAN Expert Meeting on the Environment (Jakarta, December 1978) discussed the desirability of an action plan for the ASEAN region.

2.4 A UNEP mission visited Indonesia, Malaysia, Philippines, Singapore and Thailand to explore their interest in the development of the action plan (March 1979).

2.5 The first draft of the action plan was prepared by the secretariat of UNEP in co-operation with specialized organizations of the United Nations system. It was reviewed by the Second Meeting of the ASEAN Experts on the Environment (Penang, 17-20 September 1979).

2.6 Eleven projects relevant to the development of the action plan were initiated by the secretariat of UNEP in September 1979, in co-operation with ESCAP, WHO, IMO, UNESCO and FAO (EAS-2, 3, 4, 5, 6, 7, 8, 9, 10 and 11).

2.7 The draft of the action plan was reviewed and revised by two meetings of experts designated by the countries of the region (Baguio, 17-21 June 1980 and Bangkok, 8-12 December 1980).

2.8 The representatives of Indonesia, Malaysia, Philippines, Singapore and Thailand, at the Intergovernmental Meeting on the Protection and Development of the Marine Environment and Coastal Areas of the East Asian Region (Manila, 27-29 April 1981), adopted the action plan but decided that its legal component does not need to be developed for the time being. The "development and protection of the marine environment and the coastal areas for the promotion of the health and well-being of present and future generations" was adopted as the principle objective of the action plan.

2.9 The Intergovernmental Meeting on the East Asian Seas Action Plan (Bangkok, 9-11 December 1981) (a) adopted the programme priorities for the action plan, (b) established the Co-ordinating Body on the Seas of East Asia (COBSEA), (c) endorsed the establishment of a Trust Fund and (d) requested UNEP to continue providing secretariat services to the action plan.

2.10 The first meeting of COBSEA (Bangkok, 3 April 1982) decided to initiate the implementation of the action plan through six priority projects (EAS-12, 13, 14, 15, 16 and 17), each implemented by a network of national institutions and co-ordinated by a member of the network. The involvement of international and intergovernmental organizations in these projects was not envisaged.

2.11 The ensuing regular annual meetings of COBSEA (Yogyakarta, 25-26 March 1983; Genting Highlands, 5-6 April 1984; Manila, 22-23 April 1985, Singapore, 25-26 April 1986) reviewed the progress of the action plan, decided on its future course and budget, as well as on the level of contributions to the Trust Fund

2.12 The fourth meeting of COBSEA (Manila, 22-23 April 1985) approved the implementation of an additional priority project (EAS-18).

2.13 The representative of Brunei Darussalam joined the fifth meeting of COBSEA (Singapore, 25-26 April 1986).

2.14 The preparation of the in-depth evaluation of the action plan, which is the subject of this document, was discussed and agreed at the fifth meeting of COBSEA (Singapore, 25-26 April 1986)

3. ACHIEVEMENTS

3.1 In the preparatory phase UNEP succeeded to involve a number of intergovernmental and international organizations which provided an invaluable support to the formulation of the action plan and to the identification of the major environmental problems of the region through eleven projects implemented by them (see annex I).

3.2 The adoption of the action plan and the agreement on supporting measures for the action plan are undoubtedly major achievements, although one has to keep in mind that the participating States have a very good record of regional co-operation which facilitated the adoption of the action plan. The joining of Brunei Darussalam in the COBSEA meeting in 1986, is further evidence of the action plan's vitality.

3.3 A mechanism (COBSEA) for determining programme priorities and financial allocations to specific programme activities was successfully established and functions efficiently since it was established in 1981.

3.4 A Trust Fund was established which provides partial support to programme activities through cash contributions from the participating countries. Additionally, the participating countries have supported the action plan through contributions in kind, particularly in the commitment of personnel to the implementation of its activities. The contributions in kind have been increasing more rapidly than the contributions to the Trust Fund.

3.5 National focal points for the action plan were identified by each participating Government (see annex II). They played a major role in co-ordination, on national level, of the implementation of programme priorities agreed by meetings of COBSEA.

3.6 About fifty national institutions and agencies actively participate in the implementation of agreed programme activities, thus providing a relatively broad institutional infrastructure on which the action plan rests (see annex IV). As a direct result of the involvement of these institutions in the action plan selected environmental problems have been investigated and analyzed and some measures for their mitigation have been formulated (see annex I).

3.7 More than five hundred technical personnel, most of them from the States participating in the action plan (see annex V), have been trained in various aspects of environmental protection, pollution control and environmental management techniques. The training organized and provided through the action plan contributed considerably to the capability of these personnel and their institutions to respond to the environmental problems of their countries.

3.8 Moderate technical assistance (equipment, material and experts) has been provided to national institutions participating in the action plan (see annex VI).

3.9 Considerable interregional co-operation on environmental problems was established, particularly through the training programme carried out in the framework of the action plan, with experts from the South Asian Seas and South Pacific regions (close to 100 trainees, see annex V).

4. ENCOUNTERED DIFFICULTIES

4.1 The first major difficulty was experienced at the Intergovernmental Meeting (Manila, 27-29 April 1981) which, while adopting the action plan, failed to agree on the institutional and financial arrangements needed for the support of the action plan. The situation was remedied at the subsequent Intergovernmental Meeting (Bangkok, 8-12 December 1981) (see paragraph 2.9).

4.2 Many of the national institutions, designated by the national focal points as expected participants in the networks created for the implementation of programme activities defined by COBSEA (see paragraph 2.10), did not take a very active part in these activities. The relative inexperience of some institutions, designated as co-ordinating centres for the networks, in organizing co-operative regional projects was the major factor which led to the fact that most programme activities, although conceived as regional, became national projects. The number of institutions significantly involved and making substantial contributions is limited to several in each country although the number of those involved in a more limited way is considerable, especially in terms of training.

4.3 With the notable exception of projects dealing with control of pollution from accidental oil spills, most of the other programme activities are in the field of environmental assessment (research and monitoring) without much real impact on the management of environmental problems of the region.

4.4 Some of the individual and group training activities suffered from inadequately prepared training programmes and from poorly applied selection criteria for trainees. The problem was further aggravated by the fact that a significant number of the trainees have since left their original posts and are therefore not directly involved in the action plan.

4.5 The substantive and financial reports of national institutions co-ordinating the implementation of programme activities is, in most cases, delayed and inadequate, making it difficult for UNEP to be more efficient in providing assistance to those institutions which experienced problems.

4.6 UNEP, after the loss of support from the international and intergovernmental organizations enjoyed during the preparatory phase of the action plan, and in particular since mid-1984, failed to provide an efficient technical co-ordination for programme activities expected to be carried out by the networks of national institutions according to the decision of COBSEA.

4.7 The meetings of COBSEA, while very efficient in determining programme priorities, devoted insufficient attention to the substantive analysis of the results from projects carried out under the action plan and of their relevance to the goals of the action plan. The absence of an independent scientific evaluation of the obtained results and of sound scientific advice on the environmental problems of the region which may be dealt by the action plan is felt by UNEP as a serious obstacle for the future development of the action plan.

4.8 The resources pledged to be contributed to the Trust Fund were and are received with considerable delays (see chapter 7), hampering the implementation of programme activities according to agreed schedule. The problem is further compounded by the slow project approval procedure of UNEP, even once the funds are available.

4.9 Efforts to attract financial resources for programme activities from donor agencies failed and the Environment Fund of UNEP is still the major source for cash contributions to these activities.

4.10 The contributions of international organizations outside of UNEP have been very limited since 1982, with the exception of UNESCO and IOC, which have been involved in the conduct of joint workshops and training courses in some of the projects.

5. TRAINING AND TECHNICAL ASSISTANCE

5.1 In implementation of any regional programme, particularly one which involves developing countries, a major difficulty is the varying level of technical capabilities and lack of adequate infrastructure. For this reason training and provision of technical assistance has been strongly emphasized and reiterated in each of the main elements of the action plan. With this in mind, provision of training (in the form of both individual or group training) and technical support has been a major component of the various implemented or ongoing activities.

5.2 The number of individuals who benefited from training organized through the action plan is over five hundred (see annex V). Furthermore, UNEP has sponsored participation of a number of individuals from the East Asian Seas region in meetings and symposia held in other regions but relevant to the action plan.

5.3 Technical assistance (experts and equipment) provided to the national institutions participating in the action plan was noticeable but limited in scope, due to lack of adequate financial resources (see annex VI).

5.4 The support of FAO, IMO, IOC, UNESCO and WHO, particularly in the preparatory phase leading to the adoption of the action plan, to the training activities related to the action plan was generous and efficient.

5.5 In order to maximize the benefits from the limited resources available and to encourage interregional activities and contacts, on many occasions training has not been confined to individuals of the East Asian Seas region but involved also experts from other regions.

5.6 Any attempt to evaluate the efficiency of training, technical meetings, or technical support suffers from the absence of specific feedback from individuals or institutions concerned. This however, is more or less universally true and not confined to the East Asian Seas region. Nevertheless, in the long run some indication of the efficiency of such activities will gradually manifest itself in the ways and means of how various components of the action plan were implemented. The general perception is that the technical meetings held since 1981 have been efficient.

5.7 The general perception is that the technical meetings held since 1981 in the framework of the action plan have been efficient and well prepared.

6. INSTITUTIONAL ARRANGEMENTS

6.1 The Co-ordinating Body on the Seas of East Asia (COBSEA) was established by the Intergovernmental Meeting on the East Asian Seas Action Plan (Bangkok, 9-11 December 1981) as the overall authority to guide the action plan, to review its progress and to approve its programme of implementation and budget.

6.2 The same meeting considered the establishment of a Regional Co-ordinating Unit which would technically co-ordinate the various programme activities and act as the secretariat of the action plan. Due to the financial implications, the meeting postponed the decision on the establishment of such a unit and designated UNEP to be responsible for the overall technical co-ordination and continuous supervision of the implementation of the action plan, to act as the secretariat for the action plan, and to manage the resources of the Trust Fund.

6.3 The Interim Co-ordinator of the ASEAN Experts Group on the Environment was designated to provide a channel of communication between UNEP and COBSEA between the periodic meetings of COBSEA.

6.4 Each State participating in the action plan (Indonesia, Malaysia, Philippines, Singapore and Thailand) has designated an official national focal point for the action plan:

- to act as the official channel of communication between the Interim Co-ordinator, the respective Government and the secretariat of the action plan (UNEP); and
- to co-ordinate the participation of national institutions and agencies in the agreed programme.

6.5 The national focal points represent the Governments at the meetings of COBSEA.

6.6 Since the adoption of the action plan in 1981, the agreed programme is implemented by networks of national institutions designated by the national focal points and each agreed activity is co-ordinated by a member of the network. At present about fifty national institutions participate in the ongoing activities carried out in the framework of the action plan.

6.7 The periodic meetings of COBSEA proved to be an effective mechanism for determining priorities in the programme, for reaching an agreement on the contributions to the Trust Fund and for determining financial allocations to various activities. However, the meetings of COBSEA are a weak mechanism for the technical evaluation of results achieved through these activities and for the sound analysis of newly proposed activities.

6.8 The secretariat of UNEP was weak in providing the expected effective technical co-ordination and supervision of the agreed programme which was frequently left, particularly in the period since the adoption of the action plan, to develop in an uncontrolled way. As manager of the Trust Fund and organizer of periodic meetings of COBSEA, the secretariat of UNEP proved to be more efficient, although the lengthy project approval procedures of UNEP were also an impediment contributing to the delays in the implementation of the agreed programme.

6.9 Most of the national focal points for the action plan functioned effectively as the national co-ordinators for the participation of national institutions and agencies in the agreed programme. The co-operation of the national focal points with the secretariat of the action plan (UNEP), although always cordial, was less efficient in many instances.

6.10 In the activities undertaken by UNEP during the preparatory phase leading to the adoption of the action plan (1976-1981), the specialized intergovernmental and international organizations played a very prominent and constructive role. Although these activities gave very good results, they did not involve adequately the national institutions of the region. Being aware of this major shortcoming of the activities carried out in the preparatory phase and trusting in the strength of their own national infrastructures, COBSEA decided that all programme activities should be implemented by national institutions of the region only. In spite of some encouraging results, it would be premature to pass a final judgement on the overall success of this approach. The lack of support from experienced agencies and the lack of experience in handling projects requiring international co-ordination by most of the national co-ordinating centres, is felt strongly and has caused very serious delays in the implementation of the agreed activities. In most cases it has also caused the degeneration of the projects conceived as regionally co-ordinated activities into national activities of little regional significance. Nevertheless, as the participating national institutions gain more experience and self-confidence, ultimately there may be a net benefit from such "rely-on-yourself" approach.

6.11 The action plan was initially restricted to the five ASEAN countries, with the understanding that, subject to favourable political development in the region, other neighbouring countries may join later. At the adoption of the action plan (1981) a legally binding agreement providing the legal framework for the action plan was seen as a possible impediment for that. However there are indications that the time has come to reconsider such an approach.

7. FINANCIAL ARRANGEMENTS

7.1 Financial support for the activities of the action plan were envisaged from:

- (a) contributions from participating Governments to the Trust Fund according to a scale determined from time to time by the Governments concerned;
- (b) contributions made in addition to (a) above from the participating Governments;
- (c) contributions from Governments supporting the action plan but not participating in it;
- (d) support from any United Nations organization on a project-funding basis;
- (e) support from the regional and international organizations which are not part of the United Nations Systems (e.g. ASEAN) in most cases on a project-funding basis; and
- (f) any other source of funding agreed to by the participating Governments.

7.2 The preparatory phase leading to the adoption of the action plan in 1981 was financially supported by the Environment Fund of UNEP (US \$ 732,452) and by generous contributions of specialized organizations of the United Nations system (US \$ 257,969).

7.3 After the adoption of the action plan all programme activities and the secretariat support were financed only by the Environment Fund of UNEP (US \$ 804,267) and the Trust Fund (US \$ 303,827) with support in kind and services from national institutions participating in programme activities (valued at US \$ 241,011).

7.4 No additional support from other sources listed in paragraph 7.1 was obtained.

7.5 Until the end of 1986 fifteen closed and twelve ongoing UNEP supported projects were relevant to the action plan. The Environment Fund's contribution to these projects was about US \$ 1.5 million, compared with US \$ 303,827 from the Trust Fund and close to US \$ 0.5 million from co-operating agencies and supporting organizations (see table 1).

7.6 The pledges to the Trust Fund are made at annual meetings of COBSEA. UNEP, as the manager of the Trust Fund, used the received contributions according to the allocations decided by COBSEA.

7.7 The size of the Trust Fund is very modest and since it was established in 1981 the annual pledges have not been increased significantly (see table 2), i.e. to keep at least pace with the rate of inflation. The payments to the Trust Fund are received with considerable delay causing problems with the implementation of decisions made at meetings of COBSEA.

7.8 The financial support to the action plan from the Environment Fund of UNEP will gradually decrease in line with the catalytic role of UNEP, and the action plan is ultimately expected to be financially self-supporting.

8. SUMMARY

8.1 Since the adoption of the action plan there have been changes in the environmental policies of the participating States which are in conformity with the objectives of the action plan. Though there is no direct evidence for the link between these changes and the activities of the action plan, the action plan certainly contributed to the increased environmental awareness in the States participating in the action plan and influenced the formulation of national development plans.

8.2 The remarkably numerous participation of the national institutions and agencies in the action plan is a major achievement in spite of their inability, for the time being, to exert a major influence on the programme priorities defined by COBSEA. The number of national institutions and agencies participating in the activities carried out in the framework of the action plan testifies that the action plan has succeeded in building a solid and broad institutional support which augurs well for the long-term prospects of the action plan.

8.3 No long-term strategy has evolved until now for the implementation of the action plan and the numerous completed and ongoing activities are not focused on solution of the main environmental problems which could be tackled through regional co-operation.

8.4 The substantive and financial management of the action plan was unduly lax and needs a considerable improvement.

8.5 The action plan did not succeed in mobilizing considerable national financial resources for the solution of environmental problems on national or regional level. It was also unsuccessful to attract financial support from funding organizations or donors. The resources of the Trust Fund are inadequate for any larger scale environmental action in the region.

Table 1(a) - Expenditures and commitments to the projects relevant to the preparatory phase of the East Asian Seas Action Plan
(in US \$) as at 31 December 1986

TF = Trust Fund, EF = Environment Fund, CC = Counterpart contributions over the duration of the project. Closed projects are marked with asterisk

Project No	1975 EF	1976 EF	1977 EF	1978 EF	1979 EF	1980 EF	1981 EF	1982 EF	Total EF	CC	Project Total
FP/0501-75-01 *	7,557	36,963	-	-	-	-	-	-	44,520	38,329	82,849
FP/0503-76-08 *	-	-	2,409	-	-	-	-	-	2,409	7,200	9,609
FP/0503-77-03	-	-	2,898	23,650	40,915	66,740	85,110	-	219,313	-	219,313
FP/0503-79-04 *	-	-	-	-	28,500	17,960	41,945	(10,068)	78,337	22,500	100,837
FP/0503-79-05 *	-	-	-	-	6,920	-	-	-	6,920	39,000	45,920
FP/0503-79-06 *	-	-	-	-	-	620	19,832	-	20,452	72,540	92,992
FP/0503-79-07 *	-	-	-	-	-	12,315	-	-	12,315	5,000	17,315
FP/0503-79-08 *	-	-	-	-	20,105	13,850	223	(370)	33,808	9,000	42,808
FP/0503-79-09 *	-	-	-	-	9,147	10,065	3,706	-	22,918	4,000	26,918
FP/0503-79-10 *	-	-	-	-	-	22,718	2,282	-	25,000	10,000	35,000
FP/0503-79-11 *	-	-	-	-	-	11,943	-	-	11,943	7,000	18,943
FP/0503-79-12 *	-	-	-	-	23,526	22,000	-	-	43,636	22,500	66,136
FP/0503-79-13 *	-	-	-	-	-	14,030	-	-	14,030	4,900	18,930
FP/0503-79-14 *	-	-	-	-	-	50,909	(2,212)	-	48,697	16,000	64,697
FP/0503-80-05 *	-	-	-	-	-	97,785	49,853	516	148,154	-	148,154
GRAND TOTAL	7,557	36,963	5,307	23,650	127,223	340,935	200,739	(9,922)	732,452	257,969	990,421

Table 1(b) - Expenditures and commitments to the projects relevant to the implementation phase of the East Asian Seas Action Plan
(in US \$) as at 31 December 1986

TF = Trust Fund, EF = Environment Fund, CC = Counterpart contributions over the
duration of the project. Closed projects are marked with asterisk

Project No.	1982	1983		1984		1985		1986		1987		Total			Project Total
	EF	EF	TF	EF	TF	EF	TF	EF	TF	EF	TF	EF	TF	CC	
FP/5102-77-03*	58,772	54,599	-	52,943	-	(957)	-	-	-	-	-	165,357	-	-	165,357
FP/0503-80-05*	-	(458)	-	-	-	-	-	-	-	-	-	(458)	-	-	(458)
FP/5102-82-05	28,760	72,932	-	12,408	-	29,612	-	99,900	-	45,910	-	289,522	-	-	289,522
FP/5102-82-15	-	7,553	7,553	9,562	9,562	40,778	-	5,000	10,851	12,000	6,450	74,893	34,416	40,000	149,309
FP/5102-82-16	-	10,500	10,500	14,362	8,720	15,138	7,952	59,000	15,500	-	11,750	99,000	54,422	40,000	193,422
FP/5102-82-17	-	7,532	7,532	-	-	3,332	3,332	21,500	53,690	-	22,636	32,364	87,190	28,800	148,354
FP/5102-82-18	-	11,998	11,998	23,139	31,839	(5,998)	(5,998)	9,500	37,250	-	5,000	38,639	80,089	40,000	158,728
FP/5102-82-19	-	-	-	19,469	19,276	(6,354)	(6,354)	15,360	13,805	-	9,483	28,475	36,210	40,000	104,685
FP/5102-84-06	1,091	8,152	-	8,065	-	4,225	-	6,100	-	4,950	-	32,583	-	12,438	45,021
FP/5102-84-09	-	-	-	-	-	8,000	-	-	-	-	-	8,000	-	3,060	11,060
FP/5102-85-04	-	-	-	-	-	6,392	-	-	-	-	-	6,392	-	6,713	13,105
FP/5102-85-06	-	-	-	-	-	-	-	18,000	31,000	-	19,000	18,000	50,000	20,000	88,000
FP/5102-85-07	-	-	-	-	-	7,650	-	3,850	11,500	-	-	11,500	11,500	10,000	33,000
FP/5102-86-02	-	-	-	-	-	-	-	20,00	-	20,000	-	40,000	-	-	40,000
GRAND TOTAL	88,623	172,808	37,583	139,948	69,397	101,818	(1,068)	258,210	173,596	82,860	74,319	844,267	353,827	241,011	1,439,105

Table 2. Status of pledges and received payment to the East Asian Seas Trust Fund
(in US \$) as at 31 December 1986

<u>State</u>	<u>1 9 8 2</u>		<u>1 9 8 3</u>		<u>1 9 8 4</u>		<u>1 9 8 5</u>		<u>1 9 8 6</u>	
	<u>Pledged</u>	<u>1/ Received</u>	<u>Pledged</u>	<u>1/ Received</u>	<u>Pledged</u>	<u>Received</u>	<u>Pledged</u>	<u>Received</u>	<u>Pledged</u>	<u>Received</u>
Indonesia	30,000	30,000	30,000	30,000	33,000	33,000	33,000	33,000	33,000	33,000
Malaysia	17,000	17,000	17,000	17,000	17,000	17,000	18,700	18,700	18,700	-
Philippines	19,000	19,000	19,000	19,000	19,000	19,000	19,000	19,000	20,900	1,900
Singapore	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Thailand	19,000	19,000	19,000	19,000	19,000	19,000	20,900	20,900	20,900	-
Total	86,000	86,000	86,000	86,000	89,100	89,100	92,700	92,700	94,600	36,000

8.6 Intensive training activities were carried out in the framework of each activity undertaken as part of the action plan. The results of these training are not clearly evident yet.

8.7 In spite of some highly efficient technical meetings on specific subjects treated by programme activities, one of the more serious deficiencies of the action plan is the lack of a forum which would competently examine and analyze the major environmental problems of the region and recommend actions for consideration of the action plan's policy-making body (COBSEA).

8.8 The role, substantive and financial, of the intergovernmental and international organizations was of vital importance for the action plan in its preparatory phase. The continuing involvement of these organizations in the programme activities since the action plan was adopted would have enhanced the quality of these activities.

8.9 UNEP's intellectual input and co-ordinating role was of particular and decisive importance in the preparatory phase of the action plan. While UNEP's financial support to the action plan is relatively and gradually decreasing, it was and remains, for the time being, one of the major factors influencing in the development of the action plan.

8.10 The East Asian Seas action plan is one of the smallest in the framework of the Regional Seas Programme in terms of the number of participating States and of financial resources at the disposal of the action plan. Nevertheless it is one of the more viable action plans which operates under the full control of COBSEA and would for sure survive even if UNEP were to withdraw as its secretariat. From that standpoint, UNEP's catalytic role in the East Asian Seas region was fulfilled with success.

Annex I

ANALYSIS OF ACTIVITIES CARRIED OUT IN THE FRAMEWORK OF THE ACTION PLAN

This annex contains (a) the list of all projects carried out specifically in the framework of the Action Plan or supporting the Action Plan, (b) the analysis of the results obtained by individual projects, (c) an analysis of the projects' relevance to the Action Plan, and (d) the references relevant to the analyzed activities.

A. LIST OF PROJECTS

Projects are arranged in chronological order, i.e. as they have been formally approved by the Environment Fund of UNEP. Project numbers of completed projects are underlined. The organizations responsible for the implementation of the projects are identified in the project titles. Activity codes do not correspond to project denominations used in various EAS documents.

<u>Project number</u>	<u>Project title</u>	<u>Activity code</u>
<u>FP/0501-75-01:</u>	International Workshop on Marine Pollution in East Asian Seas (IOC/FAO (IPFC))	EAS-1
<u>FP/0503-76-08:</u>	Oil Pollution Contingency Planning for the Straits of Malacca and Singapore Region - Preparatory Stage (IMO)	EAS-2
<u>FP/0503-77-03</u>	Programme Activity Centre for Regional Seas (UNEP)	EAS-Gen
<u>FP/0503-79-04:</u>	Impact of Pollution on the Mangrove Ecosystem and its Productivity in South East Asia (FAO)	EAS-3
<u>FP/0503-79-05:</u>	Regional Seminar on Environmental Impact Assessment in Southeast Asia (WHO)	EAS-4
<u>FP/0503-79-06:</u>	Workshop on Coastal Development and Management in South East Asia (UN/DIESA - ESCAP)	EAS-5
<u>FP/0503-79-07:</u>	Development of Regional Oil Spill Contingency Arrangements in South East Asia (IMO)	EAS-2
<u>FP/0503-79-08:</u>	River Inputs to South East Asian Seas (UNESCO)	EAS-6
<u>FP/0503-79-09:</u>	Research into the Toxicity of Oil Dispersant Chemicals on Tropical and Subtropical Marine Species (IMO)	EAS-7
<u>FP/0503-79-10:</u>	Overview of Land Based Pollution Sources in Southeast Asia (WHO/PEPAS)	EAS-8
<u>FP/0503-79-11:</u>	Development of Legal Instruments for the Protection of the Marine Environment in Southeast Asia (ESCAP)	EAS-9

<u>Project number</u>	<u>Project title</u>	<u>Activity code</u>
<u>FP/0503-79-12:</u>	Assessment of Oil Pollution and its Impact on Living Aquatic Resources in South East Asia (FAO)	EAS-10
<u>FP/0503-79-13:</u>	Environmental Problems of Offshore Exploration and Exploitation in Southeast Asia (ESCAP/CCOP)	EAS-11
<u>FP/0503-79-14:</u>	International Workshop on the Prevention, Abatement and Combating of Pollution from Ships in East Asian Waters (IMO)	EAS-2
<u>FP/0503-80-05:</u>	Development of a Comprehensive Action Plan for the Protection and Development of Marine Environment and Coastal Areas of the East Asian Region (UNEP)	EAS Gen
<u>FP/5102-82-05:</u>	UNEP Support for the East Asian Seas Action Plan (UNEP)	EAS Gen
<u>FP/ES/5102-82-15:</u>	Co-operative Research on Oil and Oil Dispersant Toxicity in the East Asian Seas Region (MSTE, Malaysia)	EAS-12
<u>FP/ES/5102-82-16:</u>	Study on Coral Resources and the Effects of Pollutants and Other Destructive Factors on Coral Communities and Related Fisheries in the East Asian Seas Region (NRMC, Philippines)	EAS-13
<u>FP/ES/5102-82-17:</u>	Study of the Maritime Meteorological Phenomena and Oceanographic Features of the East Asian Seas Region (NEB, Thailand)	EAS-14
<u>FP/ES/5102-82-18:</u>	Survey and Monitoring of Oil Pollution and Development of National Co-ordinating Mechanisms for the Management and Establishment of a Regional Data Exchange System (MPE, Indonesia)	EAS-15
<u>FP/ES/5102-82-19:</u>	Assessment of Concentration Levels and Trends of Non-Oil Pollutants and Their Effects on the Marine Environment in the East Asian Seas Region (NEPC, Philippines)	EAS-16
<u>FP/ES/5102-85-06:</u>	Implementation of a Technical and Scientific Support Programme for Oil Spill Contingency Planning (MPE, Indonesia)	EAS-17
<u>FP/ES/5102-85-07:</u>	Co-operative Study Into the Cleaning-Up of Urban Rivers (MinEnv, Singapore)	EAS-18

B. ANALYSIS OF INDIVIDUAL PROJECTS

The results of each project are primarily analyzed from the standpoint of how and how much did they contribute to the formulation and adoption of the Action Plan as well as to the subsequent implementation of its objectives. Activities from EAS-1 to EAS-11 fall into preparatory activities leading to the adoption of the Action Plan. Activities starting from EAS-12 were implemented after the adoption of the Action Plan.

EAS - General

**UNEP SECRETARIAT SUPPORT TO THE DEVELOPMENT AND IMPLEMENTATION OF THE EAST ASIAN SEAS ACTION PLAN
- FP/0503-77-03, FP/0503-80-05 AND FP/5102-82-05**

Secretariat support of UNEP to the development and implementation of the East Asian Seas Action Plan was provided through three internal projects. They covered:

- (a) the cost of UNEP staff and consultants involved in the co-ordination of the preparations for the adoption of the Action Plan and of its subsequent implementation;
- (b) the cost of nine UNEP convened technical and intergovernmental meetings as indicated in annex III; and
- (c) support to specific activities carried out as support to the Action Plan.

The meetings convened by UNEP have played an essential role in allowing the governments of the region to define the content of the Action Plan and to plan and follow its implementation.

The first of two technical meetings of experts to review the draft Action Plan for East Asian Seas was held in Baguio, Philippines, 17-21 June 1980, with thirty-two government experts, three invited experts, and representatives of interested organizations inside and outside the UN system. The meeting revised the draft Action Plan and gave priority to assessment activities in the Action Plan intended to lead to immediate and concrete management activities. The geographic scope was limited to the ASEAN countries in the first instance, with possible later extension to other countries. Special emphasis was placed on oceanographic phenomena, atmospheric sources of marine pollution, training of personnel in pollution control, protected areas, endangered species, and disposal of hazardous substances. Fisheries questions were excluded as they were already covered by existing regional activities. Legal measures were postponed for further consideration at the expert level.

After a review at the national level, a Second Meeting of Experts was held in Bangkok, 8-12 December 1980, to further review the draft Action Plan and to consider alternative institutional and financial arrangements for its implementation. The meeting agreed on an abridged list of regional priority assessment and management projects, with environmental impact assessment and nature conservation being left to the ASEAN Subregional Environment Programme, and others earmarked for future implementation. Proposals for a regional convention, a regional organization to oversee the Action Plan, and a trust fund were prepared for the intergovernmental meeting, with UNEP asked to take responsibility for the interim institutional arrangements through a programme co-ordinator working from the UNEP Regional Office in Bangkok.

On the recommendation of the expert meetings, an intergovernmental meeting was held in Manila, 27-29 April 1981. The meeting adopted the introduction, assessment and management parts of the Action Plan, but failed to agree on satisfactory legal measures and institutional arrangements, leaving the Action Plan with no effective means for its implementation.

It was therefore necessary for UNEP to convene another intergovernmental meeting in Bangkok, 9-11 December 1981, to reexamine the implementation of the Action Plan and in particular the essential institutional and financial arrangements. A trust fund for the region was established by UNEP and the governments pledged contributions to it while calling for increased UNEP support. The meeting decided to exclude projects executed by other agencies, and it assigned the priority projects to the different countries for implementation through lead institutions which would co-ordinate each project with participating institutions in other countries. UNEP was

asked to survey national capabilities, compile existing physical oceanographic data, prepare a directory of institutions, and identify development projects which demonstrate sound environmental practices. An annual meeting of government representatives called the Co-ordinating Body on the Seas of East Asia (COBSEA) was established to provide policy guidance, while UNEP was asked to provide overall technical co-ordination and continuous supervision. National focal points were designated and principles of co-operation established.

Operational project documents for the agreed priority projects were prepared by the UNEP secretariat in co-operation with the national focal points and submitted to the First Meeting of the Co-ordinating Body on the Seas of East Asia (COBSEA) in Bangkok, 3 April 1982, held in conjunction with the ASEAN Experts Group on the Environment. The meeting reviewed the content of each project and made plans for their immediate implementation.

The Second Meeting of COBSEA (Yogyakarta, 25-26 March 1986) reviewed the progress of the approved projects and agreed to financial allocations for the next year. It also extended the administrative and financial arrangements as previously decided.

The Third Meeting of COBSEA in Malaysia (5-6 April 1984) rephased project activities into the next biennium to account for delays in some of the projects. Contributions to the Trust Fund were continued at the same level as it was not possible to get unanimous agreement to a ten per cent increase. A priority listing was made of approved and new projects, and alternatives to meet the serious shortfall in funds were reviewed.

Further budget extensions of existing projects were approved at the Fourth Meeting of COBSEA (Metro Manila, Philippines, 22-23 April 1985) and two new projects were approved for implementation. A serious shortfall in contributions to the Trust Fund was noted. The same administrative and financial arrangements were extended for a further two years. The meeting repeated its previous requests to UNEP to make efforts to secure outside funding for EAS projects. It also repeated its request to UNEP from the Third Meeting that Brunei Darussalam be invited to become part of COBSEA.

The Fifth Meeting of COBSEA in Singapore (25-26 April 1986) updated the priority listing of projects to be supported as funds became available, determined the funding levels for each project, and further extended the programme and administrative arrangements to the end of 1987. UNEP announced the in-depth evaluation of the results in the East Asian Seas, as well as a regional overview of the state of the marine environment, to be examined at a meeting of scientists before presentation to the next meeting of COBSEA.

In reviewing the accomplishments of the five COBSEA meetings, it is clear that the meetings are an effective mechanism for determining priorities in the programme and for making financial allocations to approved projects. However, the COBSEA mechanism is weak in the technical review and evaluation of projects. The follow-up by UNEP of decisions taken at COBSEA meetings apart from the projects themselves has also been very poor. This is particularly evident in the search for additional sources of funding.

The general UNEP contribution to the East Asian Seas Action Plan has included support to a number of specific activities. During the preparatory phase, consultants were commissioned to prepare a number of background documents and to draft papers for the expert and intergovernmental meetings which led to the adoption of the Action Plan.

Two Thai oceanographers were commissioned to visit oceanographic data centres in Japan and the United States and to compile the existing data into a review of the physical oceanography of the region, resulting in one of the most substantial contributions to the Action Plan to date (47).

Eleven participants from the region were supported to attend and present papers at the 15th Pacific Science Congress in Dunedin, New Zealand in 1983, with many of the papers later published by UNEP (6).

Two scientists also attended the SACEP/ESCAP Symposium on Coral and Mangrove System Management at UNEP expense.

UNEP is funding the consultants preparing the evaluation of accomplishments in the East Asian Seas, and the expert group drafting the regional review of the state of the marine environment.

The new regional newsletter and a special EAS issue of AMBIO are also being supported by UNEP.

The major contributions of Mr. Edgardo D. Gomez as consultant to UNEP on the region and as invited expert at all the regional meetings of governments have likewise been funded largely by the general UNEP contribution.

The total cost of support provided to the Action Plan through EAS-general from 1976 to the end of 1986 is estimated as US \$821,000. The approximate breakdown of this cost is:

- staff support	US \$271,000	(33%)
- cost of meetings	US \$ 57,000	(7%)
- support to specific activities	US \$214,000	(26%)
- miscellaneous (document reproduction, staff travel, communications, premises, etc.)	US \$279,000	(34%)

Several other UNEP projects have also included EAS components with a total cost of US \$150,000. These are support to the 14th Pacific Science Congress in Khabarovsk (FP/1105-78-02), the Directory of Indian Ocean Marine Research Centres (FP/1301-75-01) and the more recent EAS Directory and Bibliography (FP/5102-84-06), a review of Indian Ocean conservation problems by IUCN (FP/5102-84-09), the Directory of Coral Reefs now being completed (FP/5102-85-04), and a study of Dugong movements (FP/5103-86-01).

References: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 47.

EAS-1

INTERNATIONAL WORKSHOP ON MARINE POLLUTION IN EAST ASIAN WATERS (IOC/FAO(IPFC)) - FP/0501-75-01

This workshop, held in Penang on 7-13 April 1976, brought together 71 of the leading scientific and technical specialists from inside and outside the greater East Asian Seas region extending from India to the USSR (12). It provided a broad overview of marine pollution problems in the region, and of the principal gaps in knowledge. Since the region considered was much broader than that subsequently adopted for the Action Plan, not all of its recommendations are immediately pertinent to what followed.

The workshop gave first priority to the following groups of pollutants:

1. Oil
2. DDT, pesticides, organochlorines, etc.
3. Heavy metals
4. Organic and biological pollutants; fertilizers
5. Silt

It recognized that priorities within this list would vary from country to country. It then listed appropriate research priorities within the region for each of these groups of pollutants. These priorities and the general recommendations adopted by this international group of specialists are still a useful guide to needs in the region, and should be considered in any evaluation of accomplishments over the last 10 years.

The workshop recommended regional projects on:

- Mangrove ecosystems as sewage and sediment buffer zones
- Comparative study of metals using oysters as indicators
- Studies of red tides in East Asian waters
- A study of physical dispersal processes in coastal waters

It also recommended pilot projects for each of six sub-regions, including four within the area of the present action plan.

Malacca Straits

1. Assessment of oil pollution and its impact on living resources
2. Assessment of sedimentation levels and their effect on the environment
3. Monitoring of selected metals
4. Assessment of health and ecological effects of pollution by degradable organic and compounds, such as sewage and agro-industrial waste

Gulf of Thailand

1. Thermal effect studies on some marine organisms of the Gulf of Thailand (in anticipation of nuclear power plant construction)
2. Effects of some agro-industrial wastes on the coastal ecosystems
3. Study of the waste assimilation capacity of the Gulf of Thailand

South China Sea

1. The impact of pollution on the mangrove ecosystem and its productivity
2. Levels of toxic metals in the living resources of the South China Sea
3. The effect of siltation on the biota of estuaries and marine coastal areas
4. The effect of oil on the marine biota of the South China Sea with particular emphasis on coastal resources

Eastern Archipelago

1. Mangrove ecosystems as sewage buffer zones
2. Impact of sedimentation and coral exploitation on reef and adjacent communities and the shoreline

The workshop cost US \$62,520 (UNEP US \$44,520 and counterpart contributions US \$18,000), which is reasonable considering the number of participants. It met its objectives and laid the conceptual foundations for much of what followed.

Of the priorities identified in Penang in 1976, the first three priority groups of pollutants: oil (EAS-12, EAS-15 and EAS-17), and organochlorine pesticides and heavy metals (EAS-16), have been the major focus of activities under the Action Plan.

Mangroves have been the subject of a major UNESCO/UNDP regional project. Organic pollutants, fertilizers and silt have been included with other non-oil pollutants in the Action Plan, but have only been considered in parts of EAS-13 and EAS-18. Thus a start, at least has been made on many of the projects highlighted ten years ago. The adoption of the East Asian Seas as a concentration area for Regional Seas and the holding of the Penang Workshop also led to a useful legal analysis of marine environmental protection in the region (13).

References: 12, 13

EAS-2

OIL POLLUTION CONTINGENCY PLANNING FOR THE STRAITS OF MALACCA AND SINGAPORE REGION - PREPARATORY STAGE (IMO) - FP/0503-76-08

DEVELOPMENT OF REGIONAL OIL SPILL CONTINGENCY ARRANGEMENTS IN SOUTH EAST ASIA (IMO) - FP/0503-79-07

INTERNATIONAL WORKSHOP ON PREVENTION, ABATEMENT AND COMBATING OF POLLUTION FROM SHIPS IN EAST ASIAN WATERS (IMO) - FP/0503-79-14

Project FP/0503-76-08 in 1976-77 was the only immediate follow-up on the part of UNEP to the 1976 Penang workshop (EAS-1). It involved a consultant visit to evaluate oil spill response capabilities and to recommended improvements and possibilities for regional co-operation in this specific sub-region. IMO used its marine pollution adviser who was already travelling in the region, at a cost of US \$9,609 (UNEP US \$2,409 and IMO US \$7,200). Dr. Wonham made his visit in November 1976 and submitted a substantial and well-documented report by mid-1977 (14).

The adviser concluded that in order to cope effectively with a moderately large oil spill (6,000 tons), it would be necessary to mobilize the resources of at least two, if not all three of the coastal states. He recommended the use of dispersants over mechanical collecting systems, which was logical given the logistical constraints and oceanographic conditions in the region, but left open the question of dispersant toxicity which had been little researched at the time. A large spill would require co-operation in communications, co-ordination of operations, amassing necessary equipment, information exchange, and training, and the adviser recommended that a regional centre be created to co-ordinate such matters.

While some parts of the Wonham report are now out of date, its analysis and recommendations are still highly pertinent. However, it seems to have been given very limited circulation, with one copy being supplied to each government, and it may thus have had less impact than it warranted.

IMO followed up this project both with its own activities, including a traffic separation scheme in the Straits of Malacca and Singapore, and with two projects, FP/0503-79-07 and FP/0503-79-14, during the next wave of UNEP activity.

Project FP/0503-79-07 was narrowed from its title to focus on another sensitive sub-region for oil spills, the Celebes Sea. The report of a two-week mission to the area in 1979 by a team of IMO/UNDP consultants noted that, with the possible exception of the Philippines, none of the countries had adequate contingency plans, and that the major stockpiles of oil spill combating equipment were far away from the Lombok Strait route either in the Malacca Strait or adjacent to

the major oil production fields. Thus while the risk of a major oil spill in the area was small, the governments would be unable to cope with one if it did occur. A meeting of 25 experts in Jakarta (7-9 January 1980) assessed the risks of oil pollution and drafted a contingency plan for the area (15). The sensitivity of some countries to regional activities in their waters was illustrated by the decision at the meeting to delete the Lombok/Makassar Strait from the area under consideration, and to prefer informal arrangements to formal legal agreements.

While the restriction of this meeting to the three countries immediately concerned by the geographical area of focus was logical from IMO's perspective, it may have been politically unwise to exclude Thailand and Singapore from an activity leading up to the Action Plan.

The project identified most of the problem areas to be covered by a contingency plan for the East Asian Seas region, and recommended specific remedial activities. Some of these, including the establishment of a sub-regional pollution control centre, have been followed up by IMO with UNDP support.

The meeting cost US \$17,315 (UNEP US \$12,315 and IMO US \$5,000).

Project FP/0503-79-14 was basically a training exercise, with 40 participants from 11 countries and territories gathered for a week in Manila (3-8 November 1980) to learn methods of control and treatment of oil spills (16, 17).

The workshop had to be postponed 10 months due to a delay in the confirmation by the host government of its invitation. It was thus too late to have much input into the Action Plan, which was fortunately not its primary purpose. It cost US \$64,697 (UNEP US \$48,697 and IMO US \$16,000). All the IMO projects were run efficiently and well within their budgets.

One serious weakness evident in this and several other projects at this time was the lack of co-ordination between the different agencies executing related projects. The UNEP-funded pollution specialist with FAO in Manila only received an invitation to the Manila workshop while it was in progress. The co-ordination that did take place seemed to be accidental and no efforts were made by UNEP to put people in touch with each other.

The projects led to an oil pollution control section of the Action Plan (paragraph 22.1) with implementation directly by IMO and by UNEP through project EAS-17.

IMO has since obtained support of US \$450,000 from UNDP for a project strengthening oil spill counter measures in the Lombok/Makassar Straits and the Celibes (Sulawesi) Sea. An on-scene co-ordinators workshop was held in Manila in 1984, and a practical training programme took place in 1985. A sub regional equipment centre was established at Davao, Philippines and provided with oil-spill control equipment. Further practical training is planned.

References: 14, 15, 16, 17

EAS-3

IMPACT OF POLLUTION ON THE MANGROVE ECOSYSTEM AND ITS PRODUCTIVITY IN SOUTH EAST ASIA (FAO) - FP/0503-79-04

This was one of two FAO-executed projects that provided major inputs for the meetings on the action plan. Through the commissioning of five country papers and a regional overview, the

holding of an expert meeting (4-8 February 1980) (18) and the employment of a pollution specialist, it produced 6 volumes of reports on the present state of mangrove ecosystems and the impact of pollution for each country (19, 20, 21, 22, 23, 24), and even a report on coral reefs (25). The data collected by the pollution specialist were also used in an extension of the project to prepare a directory of marine research centres (27).

The project identified the major sources of pollution in the area and how they differed from country to country. For instance, heavy metals were shown to be the most serious pollutants throughout the region; however, palm oil wastes were the most significant in Malaysia, whereas the greatest threat to mangroves in the Philippines was logging and reclamation activities. The project reports also listed the mangrove-related research programmes conducted by individual countries.

The participants at the expert meeting identified fourteen important research areas. After deciding that research into the effects of heavy metal pollutants and monitoring of flora and fauna would best be handled in other components of the research programme, they proposed four projects; (a) research into the effects of organic effluents on mangrove forests, (b) bioassays of pollutants on mangrove biota, (c) research into the effects of destructive factors on mangrove forests and soil quality, and (d) the impact of mangrove forest utilization on fisheries in the surrounding waters. These are reflected in paragraph 14.4 of the Action Plan.

This excellent preparatory work on mangroves obviously supported the development of the major UNESCO/UNDP Regional Mangrove Project, so that further UNEP support was not required in this field. The recent progress made in this field should be reviewed before undertaking any new activities. The coral reef paper led to one of the major projects (EAS-13) implementing the action plan.

The relatively high cost of this project, US \$100,837 (US \$78,337 from UNEP and US \$22,500 from FAO), was due to the use of a full-time expert and his extension to complete a regional bibliography on aquatic pollution (26) and a directory of marine environmental research centres (27) in implementation of this part of the Action Plan (paragraphs 13.1 and 21.1). However, the scope and quality of the results justified the expenditures.

References: 18, 19, 20, 21, 22, 23, 24, 25, 26, 27

EAS-4

REGIONAL SEMINAR ON ENVIRONMENTAL IMPACT ASSESSMENT IN SOUTH EAST ASIA (WHO) - FP/0503-79-05

This seminar was organized by WHO in New Delhi on 8-12 October 1979 for the South Asia and part of the South East Asia region. It reviewed the methodologies used in various countries for assessing the environmental impacts of development, so that participants could initiate environmental impact assessment systems in their own countries. Topics covered in the seminar included the development of EIA systems, assessment of health impacts of chemicals, environmental assessment of projects for tourist development, a model code of practice for environmental health impact assessment, and case studies of development projects in the region, including a dam reservoir, a hydroelectric plant, a liquid waste disposal programme, a solid waste disposal programme, and industrial estate, and a river development project.

The country position papers showed that among the ASEAN countries, only the Philippines had specific legislation requiring EIA. While Malaysia and Thailand had general legislation on environmental protection which empowers a government agency to require EIA, government action is not uniform. The need for EIA has been stated as a political objective in Indonesia, but it has only been carried out on an ad-hoc basis. Problems faced in the application of EIA included the lack of data, equipment, training manpower, awareness and funds, and the complex and often subjective nature of EIA leading to a lack of consensus on procedures to follow.

This seminar had already been planned by WHO with a budget of US \$39,000, and the additional UNEP funding of US \$6,920 was to add a coastal component and to support attendance from ASEAN countries other than the two already invited by WHO.

The revised content certainly made the seminar broader and more useful to the ASEAN region, but as it turned out, UNEP's impact was weak, and only one additional ASEAN participant took part in the seminar as a result of UNEP funding.

Environmental impact assessment was not included in the Action Plan as it was already covered by the ASEAN Environment Programme.

EAS-5

WORKSHOP ON COASTAL DEVELOPMENT AND MANAGEMENT IN SOUTH EAST ASIA (UN/DIESA/ESCAP) - FP/0503-79-06

This workshop was held in Manila on 3-12 December 1979 with wide participation from the ESCAP region including 26 from the five ASEAN countries, and expert input from the East-West Center and the ESCAP Co-ordinating Committee for Offshore Prospecting (CCOP). The subject matter was largely geological, covering offshore exploitation and coastal engineering, as well as coastal area planning techniques. However, it was not well focussed, with many general papers which could not have added much to participants knowledge. While those present may have benefited from such a broad review, it did not produce much of specific value to the development of the action plan. In fact, the proceedings were not published until 1981.

Follow-up took place primarily through CCOP and the ASEAN Environment Programme, and there is now a project on this topic being prepared by Indonesia for ASEAN. No further activities have been supported by UNEP.

The workshop cost UN/DIESA US \$72,540 and UNEP US \$20,452 for a total of US \$92,992, not counting the lecturers contributed by other organizations. This seems a very large investment for one workshop with little long-term impact.

Reference: 29

EAS-6

RIVER INPUTS TO SOUTH EAST ASIAN SEAS (UNESCO) - FP/0503-79-08

This UNESCO project involved a 2-month consultant mission to collect information plus a regional meeting of experts (Jakarta, 2-4 June 1980). The consultants identified the major

institutions and laboratories involved in water quality and sediment studies, assessed the status of monitoring of water quality parameters in the five ASEAN countries, and prepared a preliminary catalogue of major rivers discharging to the seas and a compilation of water quality data. The difficulty of locating water quality monitoring sites downstream of major source areas and close to river mouths in the tidal zone was noted for all five countries in the region. Other common problems were the difficulty of determining precise river basin catchment areas, and the lack of published river discharge data for some major basins.

The expert meeting recommended (1) a regional scientific project to assess river inputs to coastal waters, (2) the compilation of additional data at the national level, (3) intercalibration exercises, (4) the compilation and publication of a register of river basin areas by those countries that have not yet done so, (5) the circulation of a list of appropriate procedures and equipment, (6) the expansion of the parameters to be monitored and controlled, and (7) greater national efforts to assess quantitatively their water resources.

While the project failed to live up to the elaborate listing of products in the project document, it did produce a final report with a good rapid evaluation of the status and problems of the rivers of the region, leading to paragraph 14.3.1 of the Action Plan.

It cost US \$42,808 (UNEP US \$33,808 and UNESCO US \$9,000). However, it was seriously behind schedule as input for the meetings drafting the Action Plan during 1980. The final report is dated November 1980 and was received by UNEP only in June 1981.

Reference: 30

EAS-7

RESEARCH INTO THE TOXICITY OF OIL-DISPERSANT CHEMICALS ON TROPICAL AND SUBTROPICAL MARINE SPECIES (IMO) - FP/0503-79-09

This project was intended to assist the Philippines in selecting oil dispersants through toxicity testing. An expert was commissioned to develop an appropriate technique and to train a number of local scientists in its use. Two scientists were sent on an overseas study tour of laboratories involved in toxicity testing. The project started ahead of schedule, developed a simple technique appropriate to developing countries, and was extended to allow more time for evaluation, while producing an interim report (31) for the meeting drafting the Action Plan. In isolation it was quite admirable.

However, in another simultaneous UNEP-funded project (EAS-10), FAO had commissioned a consultant in Hong Kong to develop another more sophisticated technique for the same toxicity testing. The project report (32) notes that some liaison was developed with FAO in the field, and that in the future FAO and IMO will consider joint projects. There is no evidence in the UNEP files that this IMO technique was ever continued or that the results were published as intended. Subsequent UNEP-supported activities on this topic have used the FAO technique, although with some difficulty since instructors knowledgeable in the technique have been hard to find (see EAS-12). The project seems from the files to have produced little of lasting value for the investment of US \$26,918 (UNEP US \$22,918 and IMO US \$4,000).

References: 31, 32

EAS-8

OVERVIEW OF LAND-BASED POLLUTION SOURCES IN SOUTH EAST ASIA (WHO/PEPAS) - FP/0503-79-10

This project was to have produced a rapid evaluation of land-based pollution sources by March 1980 as input to the meetings on the action plan. However, WHO had considerable difficulty getting countries to agree to the necessary consultant visits. Singapore refused and simply supplied its own data, and even in the countries visited data were withheld by certain agencies. As a result the consultant visits were not completed until October 1980 with preliminary reports received by UNEP in December 1980, and the final report was not printed until December 1981 (33, 34). WHO managed to spend the full US \$35,000 budgeted for the project (UNEP US \$25,000 and WHO US \$10,000).

The report concluded: (1) that biochemical oxygen demand (BOD) was far greater from domestic than from industrial sources (in contrast with the findings in the Mediterranean), (2) that the pollution loads discharged to water courses and eventually reaching coastal marine waters is substantial (in particular, phosphates and nitrogen from domestic sources, and food manufacturing and textile mill wastes), (3) that heavy metal pollution appeared to be quite significant, (4) that the relative magnitudes of estimated pollution loads obtained in the study were not always in proportion to population densities, perhaps indicating faulty or insufficient data, (5) that air pollution also seemed severe, (6) that there was a lack of trained manpower, financial resources and institutional arrangements for handling pollution problems, and (7) that there was a wide gap between pollution control legislation and its implementation. There had also been little effort to upgrade the quality of information accumulated through past exercises, leading to grossly conflicting data on the same subject.

The project was poorly conceived from the beginning. Criticisms were made even before it started, and governments have raised questions about the validity of the rapid assessment method in a region where the data are so poor. The results were not sufficiently reliable to determine the need for specific remedial actions. Despite its faults, the exercise may well have helped to highlight certain pollution problems, and surveys of land-based sources of pollution were included in paragraph 14.3.1 of the Action Plan. A follow-up project using similar methods has been discussed (under EAS-16) but not implemented.

References: 33,34

EAS-9

DEVELOPMENT OF LEGAL INSTRUMENTS FOR THE PROTECTION OF THE MARINE ENVIRONMENT IN SOUTH EAST ASIA (ESCAP) - FP/0503-79-11

The consultant funded under this project surveyed national legislation and the participation of ASEAN states in international and regional agreements, and studied alternatives for regional action. He combined the three topics in a single report completed in June 1980 (36).

The report summarizes the legislation then in force and concludes that the member states' legislation needs considerable strengthening. For instance, Indonesia was weak in legislation to prevent pollution from vessel sources, while the existing environmental law of Thailand was not adequate to cope with marine pollution, particularly from shipping casualties. Few countries had ratified any of the international treaties concerning ocean pollution, and none had been ratified by all. There appeared to be doubts about the efficacy or appropriateness of some conventions for developing countries, which needed to be cleared up through group discussions.

Unfortunately the consultancy ended before either UNEP or the IUCN law centre had time to comment on the report. In any case, the hesitancy of the countries of the region to get involved in international legal agreements led to no further action being taken in the legal area. This should perhaps be re-examined given the recent changes in the international law of the sea and the needs for improved legislation at the national level. The consultancy cost US \$18,943 (UNEP US \$11,943 and ESCAP US \$7,000).

A paper prepared separately from this project (35) provided draft materials for a proposed regional convention, but this option was put off by the governments to some future time.

The only provisions for legal action finally retained in the Action Plan refer to national compilations of environmental laws (paragraph 25.2) and technical assistance in drafting national legislation (paragraph 25.3).

References: 35,36

EAS-10

ASSESSMENT OF OIL POLLUTION IMPACT ON LIVING AQUATIC RESOURCES IN SOUTH EAST ASIA (FAO) - FP/0503-79-12

This second major FAO project was originally planned in November 1976 as a joint IOC-FAO project to follow up the Penang workshop. It was then redrafted twice before being approved as a preparatory activity for the action plan. Consultant reports were commissioned (38) and an expert meeting was held in Manila (11-15 February 1980) (37). The project aimed to facilitate the establishment of a monitoring network to determine the extent of pollution in East Asian Seas, to assess the chronic effect of oil on littoral communities and fish stocks, and to investigate water circulation and the biodegradation of oil in tropical waters. Information was also compiled jointly with the other FAO project (EAS 3) for a regional bibliography on aquatic pollution (26) and a directory of marine environmental research centres (27).

The project also funded two Hong Kong consultants to prepare a manual on a reference method for oil and oil dispersant toxicity testing (different from the IMO sponsored method) which became the regional standard, and a report on non-oil pollutants as an additional input for the Action Plan (39). The final cost of the project, US \$55,750 (UNEP US \$33,250, FAO US \$22,500) was considerably below the US \$68,500 expected.

The results of the project are reflected in paragraph 14.2 of the Action Plan, and have been followed up in projects EAS-12 and EAS-15. The report on non-oil pollutants led to Action Plan paragraph 14.3 and project EAS-16.

References: 26, 27, 37, 38, 39

EAS-11

ENVIRONMENTAL PROBLEMS OF OFFSHORE EXPLORATION AND EXPLOITATION IN SOUTH EAST ASIA (ESCAP/CCOP) - FP/0503-79-13

This final project in the preparatory phase supported an ad-hoc group meeting on the marine environment (Bangkok, 20-25 March 1980) (40) and funded three consultants to CCOP to survey offshore environmental problems, appraise seabed monitoring technologies, formulate hazard assessment guidelines, and provide technical advice to CCOP on environmental implications. The consultants found the project objectives much too optimistic, and considered only the first topic in their report (41). Their preliminary report on the environmental problems of offshore exploration and exploitation in the region is clear and well-balanced, concluding that geological conditions in the region were such that offshore environmental hazards were less than in many other areas. Among other points, they note that "oceanographic and weather data for this region... were greatly insufficient to make reliable trajectory predictions" for oil spills. While national contingency plans could cope with smaller spills, large spills would require international assistance. Foreign oil companies should be encouraged to implement voluntary environmental safeguards.

The meeting suggested six projects to be carried out in liaison with UNEP: (a) assessment of the impact of offshore exploration on the non-living marine environment, (b) assessment of the impact of natural hazards of a geological, oceanographic and atmospheric nature on seabed exploration and exploitation, (c) assessment of silt and sediment loads, (d) impact of exploitation on coral reefs, (e) utilization of marine environmental data, and (f) environmental protection, safety regulation and pollution control.

The project was completed in time and at a cost of US \$18,530 out of the US \$25,000 allocated. The only problem in its execution was the failure of the consultants to contact Singapore or some of the major agencies in the Philippines.

Assessment of offshore exploration and exploitation was included in the Action Plan (paragraph 15.1) for possible later consideration, and has not been implemented. Coral reefs are covered in paragraph 14.4.2, and one sub-project of EAS-13 has considered mining sediment impacts. Marine environmental data questions are covered in paragraphs 17.5 and 22.3 being implemented through EAS-15.

References: 40, 41

EAS-12

CO-OPERATIVE RESEARCH ON OIL AND OIL-DISPERSANT TOXICITY IN THE EAST ASIAN SEAS REGION (MSTE, MALAYSIA) - FP/ES/5102-82-15

This project under the overall supervision of the Ministry of Science, Technology and the Environment of Malaysia is to co-ordinate co-operative research on oil and oil-dispersant toxicity

to marine organisms in implementation of this part of the Action Plan (paragraph 14.2.2). Participating laboratories include the Fisheries Research Institute, Penang, Malaysia; LEMIGAS, Jakarta, Indonesia; Phuket Marine Biological Centre, Thailand; and National Operations Centre for Oil Pollution, Manila, Philippines. The project got off to a slow start when there was great difficulty in recruiting an instructor for the initial training workshop planned for June 1983, as the few people knowledgeable in the technique developed in United Kingdom were unavailable. Then the building in Penang which housed a laboratory for the toxicity was condemned.

The project finally started in March 1984 when the workshop was held with the assistance of a consultant, Dr. G. Thompson, and with at least 2 participants from each of the 4 participating countries, except Singapore (Action Plan paragraph 17.4). A protocol for the toxicity tests was adopted and distributed in May 1984 (Action Plan paragraph 17.1, standardization) and tests were conducted on dispersants in conjunction with crude oil. The testing of oil was dropped, and the project concentrated on evaluating a number of dispersants for local use. An interim group meeting was held at the consultant's laboratory in Sydney, Australia, in November, 1985, when test results were discussed and a revised protocol for testing at least 10 dispersants with a few basic organisms was adopted. The final results are expected by mid-1987.

Costs of the project to UNEP and the Trust Fund through 1985 amounted to US \$75,008, and a further US \$34,301 is budgeted to 1987, for a total of US \$109,309. Of this amount, US \$51,500 has gone to training workshops and US \$21,000 for equipment.

While no specific results have been made available with which to judge the project, it does seem to have maintained its regional co-operative character, and 17% of the budget not devoted to meetings appears to have been shared with countries other than the co-ordinator. US \$109,000 is probably not a cost-effective price for the evaluation of 10 dispersants on a limited range of organisms. However, it has helped to build the capacity and experience of researchers and laboratories in 4 countries under the guidance of a competent expert. It is too early to judge whether this benefit will be self-sustaining. That depends on whether the participating countries continue to value and sponsor this type of research once the project has ended.

It might be worthwhile to have the detailed results of these experiments reviewed by one or more outside experts who could offer constructive criticisms and verify the results. The ultimate test of the success of this project will be if its results are used to select the least toxic oil dispersants for use in the region, as provided for in project EAS 17.

Reference: 42

EAS-13

STUDY ON CORAL RESOURCES AND THE EFFECTS OF POLLUTANTS AND OTHER DESTRUCTIVE FACTORS ON CORAL COMMUNITIES AND RELATED FISHERIES IN THE EAST ASIAN SEAS REGION (NRMC, Philippines) - FP/ES/5102-82-16

As the title implies, this is a complex project with several components. The first part involved surveys to determine the state of coral resources (Action Plan paragraph 14.4.1). Such surveys had already been made in the Philippines, so the focus was on starting similar surveys in the other co-operating countries. A UNESCO/UNEP workshop on coral reef survey methods was held at Phuket, Thailand in December 1982 (44) to agree on standard methods (Action Plan paragraph 17.1) and to train people in the survey technique (Action Plan paragraph 17.4). However, there were long delays in the receipt of funds from Nairobi, and the money budgeted for the 1983 surveys was not made available until March 1984, by which time the momentum generated by the 1982 workshop had been lost.

Despite considerable efforts by the Philippines co-ordinator, the Natural Resources Management Center, the response from the other countries was very poor. Indonesia said it had done a survey in 1984, and Malaysia reported a study by the Universiti Pertanian Malaysia completed in 1985. Thailand said theirs was continuing. Other than a final report received from Malaysia in 1986, no other data or reports had been received by the co-ordinators over three and a half years. Only 17% of the project's budget not related to meetings was shared with other countries as no fund requests were made by them despite the co-ordinator's queries.

As a support to this project, in accordance with the training component of the Action Plan (17.4), a Coral Taxonomy Workshop and Training Course was held in Phuket, Thailand, on 6-26 February 1984 (45), although it was nearly delayed by the slow receipt of funding. A further inter-regional Workshop on Coral Taxonomy and on Fish Census methods was held in 1986 (Bolinao, Philippines, 12-25 May 1986) with participants from the South Pacific and East Africa as well as East Asia. Both workshops benefited from close collaboration with UNESCO which has made important substantive and financial contributions to standardization and training under this project. The workshops have made an effective and important contribution to several Action Plans.

The second part of the project concerns the effects of pollution and other destructive factors on corals and reef fisheries (Action Plan paragraph 14.4.2). These studies occupied the bulk of the effort in the Philippines, with some later work also in Thailand.

Five different Philippine studies were started, each considering an important aspect of reef damage and reef management.

1. The first study by the Marine Science Institute of the University of the Philippines was of the ability of a coral reef to recover from the kind of damage caused by fishing with explosives, and involved the study of regeneration on artificial substrates. The main purpose was to simulate a devastated reef area and to monitor the kinds of processes that occur in the direction of recovery, as well as to gain an idea on the length of time involved. The experiment was designed accordingly, with the artificial substrates set up in the field to follow as closely as possible the natural reef surface. The study has produced some useful long-term, information on the slowness of reef recovery after damage (only 1-2% recovery of live coral cover over three years) that will be useful background for management decisions.

2. The second study also by the Marine Science Institute of the University of the Philippines compared fish resources of three reef sites at varying distances from a river mouth polluted by mining tailings. While considerable information has been collected at the sites, not much analysis has been included in the progress reports. The 1986 extension proposes to look at the impact of heavy metals in the tailings on the local populations which depend on the fish.

3. The study of the problems of managing protected areas in the face of subsistence and commercial fishing pressures by Silliman University has made some very interesting observations on the socio-political aspects of reef management and the effectiveness of protected areas. Local subsistence fishermen accepted the protected area concept and found their fishing improved, but outside commercial interest could use political pressure to override management measures to their own short-term advantage.

4. The research project on the effects of siltation on corals by the Bureau of Fisheries and Aquatic Resources was poorly designed and poorly executed. It was not clear at first how siltation effects were to be measured. The poor design of sediment traps meant that all were lost or damaged, and while an increase in coral cover was measured, it could not be related to siltation. Then coral assessment methods were changed in mid-experiment. The result was lots of data with little possibility of significant analysis. The researchers now propose to test coral transplantation as a technique to hasten regeneration in silted environments. Their data may be more useful for this than they were for the original experiment.

5. The study of tourism impacts on coral reefs by the Natural Resources Management Center also got off to a bad start. The first methods used proved unworkable, but the subsequent reliance on direct observations of damage by anchors and divers produced some valuable quantitative information on a subject where only general impressions were previously available. This project is now being reoriented to look at the effects of aquarium fish and shell collecting on the coral reef ecosystem.

The above flaws would have been minimized and the quality of the results greatly improved had an evaluation been conducted during the early stages of the project. As can be seen from the above summaries, this project addressed a number of issues critical to coral reef management. The questions have been good ones, but the scientific resources to answer them have not been as effective as would have been desired. The possibilities for on-going review and constructive criticisms in such studies need to be strengthened.

The project cost US \$67,172 through 1985, and an additional US \$86,250 are budgeted to 1987, for a total of US \$153,422. Of this amount, nearly US \$35,000 was allocated to meetings, US \$39,000 to professional personnel, US \$24,000 to equipment and US \$17,500 to subcontracts. A part of the personnel budget has supported Dr. E. D. Gomez as UNEP consultant for the whole action plan, and is thus not directly attributable to this project, bringing the total more into line with the other projects.

The management of this project by the Natural Resources Management Center has been exemplary, with careful accounting (even catching errors in project revisions by UNEP) and extensive and substantive progress reports submitted regularly every 6 months. One interesting if somewhat unorthodox feature has been the use of the personnel funds to make small incentive payments to many of those working actively on the project (on a sliding scale from the co-ordinator and senior consultants down to students and technicians). This has obviously produced results in terms of conscientious execution of the project.

References: 43, 44, 45

EAS-14

STUDY OF THE MARITIME METEOROLOGICAL PHENOMENA AND OCEANOGRAPHIC FEATURES OF THE EAST ASIAN SEAS REGION (NEB, Thailand) - FP/ES/5102-82-17

This project implemented by the National Environment Board, Thailand, in accordance with paragraphs 13.2 and 14.1 of the Action Plan was to produce a report on marine meteorological phenomena and a report on oceanographic features, and to organize and co-ordinate an oceanographic research network of 17 institutions in 4 countries. It got off to a good start with a workshop on standardization of physical oceanography methods and data held in Phuket (25-29 July 1983) (46). However the first progress report noted that the other countries were not ready to start nearshore oceanographic work, and the project subsequently became in effect a Thai national project although some of the results have regional importance.

The field research part of the project was modified to become a pilot project in Thailand to develop methodology and demonstrate it to other countries, but it has been far from effective. The cruises planned in 1983 were not held because of budgetary constraints (yet only 30% of the project funds were spent that year). No project expenditures were made at all during 1984, although cruises were made that year (contributed by Thailand as is appropriate to national activity). Sophisticated current meters for 3 monitoring stations (Action Plan paragraph 14.1.3)

in the Gulf of Thailand were finally ordered in 1985, but they proved defective on delivery and had to be returned to the Norwegian manufacturer. It was hoped to start data collection in 1986, but the workshop on marine environmental monitoring instrumentation and data collection to which the data were to be presented has had to be postponed.

Progress has been better on the production of reports. A study tour by Prof. A. Siripong of Chulalongkorn University and another Thai oceanographer in April 1983 permitted the collection of existing oceanographic information in the data centers in Japan and Washington (financed by US \$21,000 from the UNEP Internal Project). Prof. Siripong produced a Manual on Compilation and Exchange of Marine Environmental Data and Information (as part of EAS - 15) in December 1983 (51), and then 5 substantial volumes (over 1,500 pages) on the Hydrography of the South China Sea and the Gulf of Thailand in 1985 (47). These reports provide a comprehensive review and synthesis of the oceanographic literature on the region, and obviously will fulfil this aspect of the Action Plan (paragraph 13.2) when completed. An extensive "bibliography" was submitted to UNEP for publication in January 1984, but this consisted only of print-outs from a DIALOG computer search with no organization or sorting and many inappropriate references, and is thus worthless in its present form.

On the meteorological side, a report on the Climate of the Coastal Areas Surrounding the South China Sea was completed by the Thai Meteorological Department in late 1985 (48), making some progress towards the meteorological component of the Action Plan (paragraph 14.1.1).

The project cost US \$21,728 through 1985 (not counting the US \$21,000 from the internal project), with US \$97,826 approved for 1986-87, making a total of US \$119,554. Of this amount only US \$18,000 was allocated to meetings, while over US \$50,000 is for equipment and equipment maintenance. There has also been a recent steep increase in the budget for professional personnel (US \$37,180 for 1986-87). Given that most of the reports produced to date (by Prof. Siripong) were not financed by this project but largely by the internal project and EAS-15, the expenditure seems rather out of proportion with the result. The accomplishments in 1986-87 should be evaluated very carefully.

References: 46, 47, 48, 51

EAS-15

SURVEY AND MONITORING OF OIL POLLUTION AND DEVELOPMENT OF NATIONAL CO-ORDINATING MECHANISMS FOR THE MANAGEMENT AND ESTABLISHMENT OF A REGIONAL DATA EXCHANGE SYSTEM (MPE, Indonesia) - FP/ES/5102-82-18

This is really two projects, both co-ordinated by the Office of the State Minister for Population and Environment, with a single budget. The first, with the Oil and Gas Technology Research and Development Center "LEMIGAS" as the lead institution, is to survey oil pollution sources and monitor oil pollution. The second, with the State Ministry for Population and Environment and the National Institute of Sciences as lead institutions, is to co-ordinate the establishment of an information and data exchange system.

The oil pollution project was to determine the extent and level of oil pollution in the EAS region and to assess the processes involved in dispersion and degradation of contaminants in

accordance with Action Plan paragraph 14.2.1. Four methods of measuring contamination were to be utilized: (1) recording of observed oil slicks, (2) sampling and analysis of dissolved/dispersed oil in water, (3) sampling and analysis of floating particulate petroleum residues, and (4) measuring the density of stranded tarballs on beaches. There was to be an intercalibration exercise and workshops on monitoring methods and networks.

The first activity started with a regional technical meeting on monitoring oil pollution (Jakarta, 9-10 August 1983) to standardize techniques used for measuring oil contaminants. The meeting agreed that related activities which would support the techniques of oil contaminants measurement like intercalibration exercises on the laboratory analyses were needed. Also, discussions on the joint survey activity led to the selection of the Straits of Malacca as the study site.

In accordance with the above, an intercalibration exercise on the analysis of hydrocarbon in water was carried out by nine (9) laboratories in the region for the period October 1983-December 1984. From the results obtained, further intercalibration exercises are necessary. With regards to the survey of the Straits of Malacca which was originally scheduled in 1984 as proposed in the Second COBSEA Meeting (1982) and agreed in the Third Meeting (1983), the activity was delayed due to a deficient Trust Fund Allocation. A proposed budget revision was endorsed by the COBSEA meeting in 1984. Since the approved fund was received in late 1985, the survey was conducted only in August 1986 in Pulau Sambu.

To implement the Action Plan provisions for comparable data methodology and regional data exchange (paragraphs 17.5 and 22.3), a workshop on information and data exchange was organized in Jakarta, 17-19 March 1983 (49). It considered country reports and recommended strengthening national data networks as a basis for strengthening regional co-operation between the networks. It also decided to prepare a regional directory of marine scientists and national bibliographies on the marine environment. Apart from the preparation by A. Siripong of a manual on the Compilation and Exchange of Marine Environmental Data and Information (December 1983) (51), there appears to have been no further action on this topic until the Consultative Meeting on Information and Data Exchange in 1986 (Bali, 17-19 March) (52). This meeting essentially repeats (and quotes from) the 1983 meeting. No real progress was made except to recommend that microcomputers be used, and a project proposal for this is being developed with UNESCO/IOC.

A joint list of publications and reports on the marine environment is being circulated in draft form within the region, and should be finalized in December 1986. A directory of marine scientists is also apparently in process in further implementation of Action Plan paragraph 21.1.

The administration of this project needs to be greatly improved. None of the required six-monthly progress reports has ever been submitted despite repeated requests from UNEP. The only substantive reports have been those of the meetings, which were prepared promptly. Very little is said in the annual reports to COBSEA. It is thus impossible to evaluate the results of the project.

Despite this lack of activity, the project cost UNEP US \$66,978 through 1985, with a further US \$51,750 approved by COBSEA for 1986-87, for a total of US \$118,728. Of this amount, US \$80,150 is for meetings; the two 1983 meetings alone cost US \$27,000 for meetings of 2 and 2 1/2 days with 10 and 12 participants, respectively. The recent meetings are budgeted at US \$33,000 each. No more than 5% of the remaining funds were shared with other countries. The accounting on this project must follow standard U.N. procedures.

References: 49, 50, 51, 52

EAS-16

ASSESSMENT OF CONCENTRATION LEVELS AND TRENDS OF NON-OIL POLLUTANTS AND THEIR EFFECTS ON THE MARINE ENVIRONMENT IN THE EAST ASIAN SEAS REGION (NEPC, Philippines) - FP/ES/5102-82-19

This project co-ordinated by the National Environmental Protection Council of the Philippines covers all pollutants other than oil, from sediment through heavy metals to chlorinated hydrocarbons. It includes two types of activities: determining pollution levels and trends (Action Plan paragraph 14.3.2), and evaluating the effects of the pollutants (Action Plan paragraph 14.3.3). A first meeting of 19 participating institutions was held on schedule in February 1983 (Manila, 14-17 February) (53) and a consultant was recruited for training. A training workshop on analytical techniques for environmental monitoring (heavy metals) was organized in 1984 (Manila, 28 May - 8 June, 15 participants) (54) with inter-regional participation from SPREP, while SPREP organized a similar workshop on organochlorine compounds with EAS participation (23 June 4 July 1986, 19 participants). These workshops support both the training (paragraph 17.4) and standardization (paragraph 17.1) components of the Action Plan, and appear to have been well run with technical assistance from IAEA and IOC. Thirty-four analytical specialists benefited from this specialized training. Regular progress reports have been submitted, with 12 laboratories in 4 countries reported participating. An intercalibration exercise on trace metals has also been carried out (Action Plan paragraph 17.2). While the project has developed more slowly than originally planned, there has been a continuing effort to improve the analytical capabilities in all the participating countries, and over a quarter of the non-meeting funds seem to have been shared with countries other than the organizer. Monitoring and sampling activities were reported for Malaysia, Philippines and Thailand.

For the second activity concerning the effects of pollutants, less has been done, but the terms of reference have been defined, and work is supposed to start by mid-1986. While no reports have been submitted to UNEP with substantive results from this project, it gives the impression of strengthening national capacities for pollution monitoring.

Financially this has been the least expensive of this group of projects. US \$26,037 was spent through 1985 and US \$38,648 approved for 1986-87, making a total of US \$64,685. Of this, US \$52,000 is for workshops and training, which tend to be more expensive because of the very technical nature of the subject.

References: 53, 54

EAS-17

IMPLEMENTATION OF A TECHNICAL AND SCIENTIFIC SUPPORT PROGRAMME FOR OIL SPILL CONTINGENCY PLANNING (MPE, Indonesia) - FP/ES/5102-85-06

This project is co-ordinated by the Office of the State Minister for Population and Environment, Indonesia, with the Directorate of Sea Communications and PERTAMINA - State Oil Enterprise as lead institutions. It is one of the first to implement the environmental management component of the Action Plan (paragraph 22.1.2). It aims to identify susceptible areas and probable oil trajectories, organize a workshop on oil spill impact assessment, carry out an environmental impact assessment when (or if) a spill occurs, and develop a framework and guidelines for specialist environmental impact assessment teams. The results of the project on oil dispersant toxicity (EAS 12) are to be integrated into oil combating plans.

A budget of US \$68,000 was approved for 1986-87, including US \$24,000 for the workshop, and a surprising US \$22,500 for professional and administrative personnel, while indicating that more funds will need to be found to recruit a consultant to assist the project. While 12 institutions are supposed to participate in the project, there is no indication if or how the funds will be shared with other countries.

No reports on the project other than the report to COBSEA have been received by UNEP since it began in January 1986.

EAS-18

CO-OPERATIVE STUDY INTO THE CLEANING-UP OF URBAN RIVERS (MinEnv, Singapore) - FP/ES/5102-85-07

A start on the pollution control and waste management section of the Action Plan (paragraph 22.2) was made through this short project carried out by the Ministry of the Environment, Singapore. The aim was to collect country reports for a workshop at which experience could be shared and recommendations made for (a) abatement of urban river pollution and (b) development of water quality monitoring programmes.

In contrast with some other EAS projects, this one was executed with exemplary efficiency. Even though project approval was delayed due to the OCA/PAC move, the workshop scheduled for February 1986 was held ahead of schedule in January (Singapore, 14-16 January 1986), the full report was received by UNEP in early March (55), and the accounts closed and excess money refunded in April. All six ASEAN countries participated fully. Only US \$10,434, or less than half of the budgeted US \$23,000, was spent on the project.

While the workshop recommendations are not very concrete, there was obviously a useful exchange of experience, particularly in showing what Singapore has accomplished in cleaning up its own urban rivers (90% reduction in pollution levels) and precisely how this was done. Malaysia indicated that pollution from the oil palm and rubber processing industries had been brought under control, leaving river siltation from soil erosion, and the discharge of sewage as the major sources of pollution. Thailand noted that water quality has deteriorated in its four main rivers during the dry season as a result of the discharge of organic wastes. Participants recommended that pollution be tackled at its source, requiring sewerage infrastructure in urban areas and individual treatment plants in less populated areas. The enactment and enforcement of legislation, including zoning ordinances, and public awareness programmes, were also required. The need expressed for less costly pollution control technologies appropriate to the region had already been expressed at the Penang Workshop 10 years ago. Perhaps it is time for more specific action on this topic.

Reference: 55

C. ANALYSIS OF PROJECTS' RELEVANCE TO THE ACTION PLAN

<u>Envisaged by the Action Plan</u>		<u>Implemented</u>	
Paragraph	Activity	Activity	Comments
11	Identification of the present quality of the marine environment and coastal areas, factors affecting its quality and projection of future trends	EAS General	A regional review of the state of the marine environment is now being undertaken.
12	Formulation of a co-ordinated basic and applied marine science programme		Not implemented.
13.1(a)	Compilation of a directory of scientific institutions, research centres, information centres and data sources	EAS-3 EAS-10	A directory of research centres has been published by FAO/UNEP, 1984.
13.1(b)	Compilation of a compendium of ongoing and planned research work and scientific studies		Not implemented.
13.1(c)	Compilation of publications and reports on environmental problems of the region	EAS-15	Compilation in progress.
13.2	Compilation and synthesis of data on physical oceanography of the region	EAS General EAS-14	Compilation and synthesis in written form nearly completed; not yet available as a data base.
14.1	Assessment of oceanographic phenomena	EAS-14	Some observations made, but project not well advanced.
14.2.1	Survey of oil pollution sources and monitoring of oil pollution	EAS-15	Two short localized surveys made but results not available.
14.2.2	Co-operative research on oil and oil dispersant toxicity	EAS-12	Project nearing completion.
14.3.1	Survey of rivers and of land-based sources of non-oil pollutants		Planned but not implemented.
14.3.2	Study of concentration levels and trends of non-oil pollutants	EAS-16	Capacity to study non-oil pollutants developed in four countries.

<u>Envisaged by the Action Plan</u>		<u>Implemented</u>	
Paragraph	Activity	Activity	Comments
14.3.3	Study of non-oil pollutants' effects on the marine environment	EAS-16	Work just beginning.
14.4.1	Survey of the state of mangrove and coral resources	UNESCO/UNDP EAS-13	Partial surveys of coral resources made in some countries. Mangroves covered by UNESCO/UNDP project.
14.4.2	Study of effects of pollution and factors on mangroves and corals, and related fisheries	EAS-13	Several coral studies, mostly in Philippines.
15.1	Environmental impact assessment of sea-bed exploration and exploitation		Not implemented.
15.2	Effects of thermal pollution on the coastal environment		Not implemented.
15.3	Assessment of pollution reaching the marine environment through the atmosphere		Not implemented.
17.1	Standardization of methodology for marine pollution studies	EAS 12, 13, 15, 16	Included in all appropriate projects.
17.2	Quality control of data obtained through marine pollution studies	EAS 14, 15, 16	Intercalibration exercises carried out, more work needed.
17.3	Establishment of regional equipment maintenance service		Not implemented.
17.4	Training of scientists and Technicians	EAS 12, 13, 14, 15, 16, 17, 18	About 250 scientists and technicians trained in all projects.
17.5	Implementation of compatible data management procedures	EAS-15	Proposals made but not implemented for oceanographic data.
21.1	Compilation of a directory of institutions involved in environmental management	EAS-3 EAS-10	Only directory of research centres prepared by FAO/UNEP, 1984.
21.2	Identification of development projects demonstrating sound environmental management practices		Requested of UNEP, not implemented.
22	Establishment and strengthening of national pollution control co-ordinating mechanisms	EAS-18	Some action at national level.

<u>Envisaged by the Action Plan</u>		<u>Implemented</u>	
Paragraph	Activity	Activity	Comments
22.1.1	Training on prevention, abatement mitigation and combating oil pollution	IMO	Implemented by IMO.
22.1.2	Implementation of programmes for national and regional oil pollution control contingency planning	EAS-17 IMO	Continuing assistance from IMO, project recently started under Action Plan.
22.1.3	Implementation of activities and services to curb operational oil pollution from ships	IMO	Assistance from IMO.
22.1.4	Establishment of regional advisory service for national oil pollution control activities	IMO	IMO Regional Adviser on Marine Pollution based in Jakarta, 1986.
22.2.1	Development and application of principles and guidelines for discharge of wastes into coastal waters		Proposals made, not implemented.
22.2.2	Research on sites which may be suitable for dumping of hazardous waste		Not implemented.
22.3	Development and/or strengthening national co-ordinating mechanisms for data management	EAS-15	Discussed but little apparent implementation.
25.1	Establishment of co-ordinating mechanism for the implementation of the Action Plan	EAS General	COBSEA with UNEP as secretariat adopted initially as interim arrangement; better ongoing co-ordination within the region is needed.
25.2	Maintenance of up-to-date compilation of national laws relevant to the protection of the marine environment		Some progress on a national level.
25.3	Provision of technical assistance for drafting and up-dating national legislation relevant to the protection of the marine environment		Not implemented.
26.	Setting-up of financial arrangements supporting the implementation of the Action Plan		Trust Fund established but contributions inadequate.

D. REFERENCES

The following list gives the principal reports and publications to result from the different projects under the Action Plan or from activities stimulated by the Action Plan.

1. Report of the Meeting of Experts to Review the Draft Action Plan for the East Asian Seas, Baguio, 17 - 21 June 1980. UNEP/MG.41/4. 8 July 1980 (14 pages & 5 annexes).
2. Report of the Second Meeting of Experts to Review the Draft Action Plan for the East Asian Seas, Bangkok, 8 - 12 December 1980. UNEP/MG.52/6. 12 December 1980 (12 pages & 9 annexes).
3. Report of the Intergovernmental Meeting on the Protection and Development of the Marine Environment and Coastal Areas of the East Asian Region, Manila 27 - 29 April 1981. UNEP/IG.26/6. 15 May 1981 (32 pages).
4. Report of the Intergovernmental Meeting on the East Asian Seas Action Plan. Bangkok, 9 - 11 December 1981. UNEP/IG.31/6. 11 December 1981 (15 pages & 8 annexes).
5. Report of the First Meeting of the Co-ordinating Body on the Seas of East Asia (COBSEA), Bangkok, 3 April 1982. UNEP/IG.37/10. 3 April 1982 (5 pages & 10 annexes).
6. Environment and resources in the Pacific. (Papers presented at the 15th Pacific Science Congress, Dunedin, New Zealand, February 1983) UNEP Regional Seas Reports and Studies No. 69. UNEP 1985. Contains the following papers on East Asian Seas:

- K. Snidvongs - Overview of the East Asian Seas Action Plan
- A. Soegiarto - Oceanographic assessment of the East Asian Seas
- H. T. Yap and E. D. Gomez - Coral reef degradation and pollution in the East Asian Seas Region
- A. Maheswaran - Integrated coastal development in Malaysia and possible regional implications
- J. Bilal - The state of hydrocarbon pollution in the East Asian Seas based on studies in the South-East Asian Seas Region
- A. F. Kapauan - Planned regional co-operation in East Asian Seas for non-oil pollution research - problems and possible solutions
- M. Hungspreugs - Marine pollution by heavy metals in the East Asian Seas Region
- H. Chansang - Tin mining and sedimentation effects on shallow water benthic communities

7. Report of the Second Meeting of the Co-ordinating Body on the Seas of East Asia (COBSEA), Yogyakarta, Indonesia, 25 - 26 March 1983. UNEP/IG.44/11. 26 March 1983 (8 pages & 4 annexes).

8. Report of the Third Meeting of the Co-ordinating Body on the Seas of East Asia (COBSEA), Genting Highlands, Malaysia, 5 - 6 April 1984. UNEP/IG.52/10. 6 April 1984 (11 pages & 4 annexes).
9. Report of the Fourth Meeting of the Co-ordinating Body on the Seas of East Asia (COBSEA), Metro Manila, Philippines, 22 - 23 April 1985. UNEP/IG.62/12. 23 April 1985 (9 pages & 5 annexes).
10. IUCN/UNEP. Management and conservation of renewable marine resources in the East Asian Seas region. UNEP Regional Seas Reports and Studies No. 65. UNEP, 1985. (81 pages).
11. Report of the Fifth Meeting of the Co-ordinating Body on the Seas of East Asia (COBSEA), Singapore, 25 - 26 April 1986. UNEP/IG.65/12 27 June 1986 (11 pages & 6 annexes).
12. Report of the IOC/FAO (IPFC)/UNEP International Workshop on Marine Pollution in East Asian Waters. Universiti Sains Malaysia, Penang, 7 - 13 April 1976. Intergovernmental Oceanographic Commission (IOC), Workshop Report No. 8. UNESCO, 1976. (52 pages).
13. Protection of the marine environment in the East Asian Waters. Japan Institute of International Environmental Law, Yokohama, Japan, April 1977 (126 pages).
14. Wonham, J. Report of UNEP Project No. FP/0503-76-08. Oil pollution and contingency planning for the Straits of Malacca and Singapore region - Preparatory stage. Inter-Governmental Maritime Consultative Organization, 13 April 1977. (35 pages & 9 appendixes).
15. Report of the Meeting on the Development of Sub-Regional Oil-Spill Contingency Arrangements in the Celebes (Sulawesi) Sea. Jakarta, 7 - 9 January 1980. Inter-governmental Maritime Consultative Organization, OSCA/5, 1980. (9 pages & annexes).
16. Report of the IMCO/UNEP International Workshop on the Prevention, Abatement and Combating of Pollution from Ships in East Asian Waters, Manila, Philippines, 3 - 8 November 1980. UNEP/WG.52/INF.10. 25 November 1980. (3 pages & 4 annexes).
17. Hann, R. W., Jr., and S. F. Dennis. The status of oil pollution and oil pollution control in the South East Asia region. Texas A & M University, College Station, 1981.
18. Report of the FAO/UNEP (in collaboration with UNESCO and IUCN) Expert Consultation Meeting on Impact of Pollution on the Mangrove Ecosystem and its Productivity in South East Asia, Manila, Philippines, 4-8 February 1980. South China Sea Fisheries Development and Co-ordinating Programme, Manila, February - March 1980. UNEP/WG.41/INF.14 (19 pages).
19. Gomez, E. D. The present state of mangrove ecosystems in South East Asia and the impact of pollution - Regional. (FAO/UNEP), South China Sea Fisheries Development and Co-ordinating Programme, Manila, March 1980. SCS/80/WP/94 (Revised) (102 pages).
20. Soegiarto, A. The present state of mangrove ecosystems in South East Asia and the impact of pollution - Indonesia. (FAO/UNEP) South China Sea Fisheries Development and Co-ordinating Programme, Manila, March 1980. SCS/80/WP/94a (Revised) (65 pages).
21. Sasekumar, A. The present state of mangrove ecosystems in South East Asia and the impact of pollution - Malaysia. (FAO/UNEP), South China Sea Fisheries Development and Co-ordinating Programme, Manila, March 1980. SCS/80/WP/94b (Revised) (80 pages).

22. Gomez, E.D. The present state of mangrove ecosystems in South East Asia and the impact of pollution - Philippines. (FAO/UNEP), South China Sea Fisheries Development and Co-ordinating Programme, Manila, March 1980. SCS/80/MP/94c (Revised) (88 pages).
23. Zoology Department, University of Singapore. The present state of mangrove ecosystems in South East Asia and the impact of pollution - Singapore. (FAO/UNEP), South China Sea Fisheries Development and Co-ordinating Programme, Manila, March 1980. SCS/80/MP/94d (Revised) (76 pages).
24. Piyakarnchana, T. The present state of mangrove ecosystems in South East Asia and the impact of pollution - Thailand. (FAO/UNEP), South China Sea Fisheries Development and Co-ordinating Programme, Manila, March 1980. SCS/80/MP/94e (Revised) (108 pages).
25. Gomez, E.D. Status report on research and degradation problems of the coral reefs of the East Asian Seas. (FAO/UNEP), South China Sea Fisheries Development and Co-ordinating Programme, Manila, May 1980. UNEP/WG.41/INF.15 (68 pages).
26. 1972-1981 Bibliography of the marine environment: East Asian Seas. UNEP Regional Seas Directories and Bibliographies 11. FAO, Rome, 1984 (68 pages).
27. Marine environmental centres: East Asian Seas. UNEP Regional Seas Directories and Bibliographies 12. FAO, Rome, 1984. (138 pages).
28. WHO Regional Seminar on Environmental Impact Assessment, New Delhi, 8 - 12 October 1979. World Health Organization. SEA/EH/235, 7 March 1980. (38 pages).
29. Valencia, M. J. (ed.). Proceedings of the Workshop on Coastal Area Development and Management in Asia and the Pacific, Manila, Philippines, 3 - 12 December 1979. East-West Center/University Press of Hawaii, 1981. (202 pages).
30. Report of the UNESCO Expert Consultation on River Inputs to South East Asian Seas, Jakarta, Indonesia, 2 - 4 June 1980. UNESCO, Paris, June 1980. UNEP/WG.41/INF.9 (23 pages).
31. Wilson, K. W. UNEP/IMCO Project FP/0503-79-09 (2100) "Toxicity of oil dispersants to tropical marine species." Report on consultant's initial visit to the Philippines. January 1980 (57 pages).
32. Wilson, K. W. IMCO-UNEP Project FP/0503-79-09 (2100) "Toxicity of oil dispersants to tropical marine species." Final Report. January 1981. (52 pages & 2 appendices).
33. Preliminary assessment of land-based sources of pollution in East Asian Seas. Summary report. WHO Western Pacific Regional Centre for the Promotion of Environmental Planning and Applied Studies (PEPAS) Malaysia, 1981 (14 pages).
34. Preliminary assessment of land-based sources of pollution in East Asian Seas. Full report. WHO PEPAS, 1981 (236 pages).
35. Japan Institute of International Environment Law. Guidelines for a convention on the protection of the marine environment in the East Asian region. 8 May 1980. UNEP/WG.41/INF.24.
36. Venkatesh, S. Comparative study of national legislations for protection of the marine environment in the ASEAN subregion. (ESCAP/UNEP) 16 September 1980. UNEP/WG.41/INF.23 (62 pages).

37. Report of the FAO/UNEP in collaboration with IOC Expert Consultation Meeting on Assessment on Oil Pollution and its Impact on Living Aquatic Resources in South East Asia, Manila, Philippines, 11 - 15 February 1980. South China Sea Fisheries Development and Co-ordinating Programme, Manila, February 1980. (29 pages) UNEP/WG.41/INF.11 (19 pages).
38. Bilal, J. Status report on research, monitoring and assessment of oil pollution in South East Asia. FAO, SCS/Oil Poll/80/8.
39. Phillips, D. J. H. Proposal for monitoring studies on the contamination of the East Asian Seas by trace metals and organochlorines. South China Sea Fisheries Development and Co-ordinating Programme, Manila, May 1980. UNEP/WG.41/INF.13.
40. Summary report on the Ad-Hoc Group Meeting on the Marine Environment, Bangkok, 20 - 25 March 1980. Committee for Co-ordination of Joint Prospecting for Mineral Resources in Asian Offshore Areas (CCOP), Bangkok, 8 April 1980. ROPEA - R.092.
41. Rioux, R. L., N. T. Edgar and F. F. H. Wang. Preliminary report on environmental problems of offshore exploration and exploitation in South East Asia. (May 1980). CCOP, Bangkok.
42. Progress report on project UNEP/EAS 2.2 - Co-operative Research on Oil and Oil Dispersant Toxicity Testing, for the period 1.1.1985 to 31.3.1986 (includes revised protocol). Department of Environment, Malaysia, April 1986. UNEP/IG.65/7.
43. EAS 4 Project in the Philippines. Progress reports: June 30, 1983; December 31, 1983; June 30, 1984; July-September 1984; October 1984 - March 1985, April-September 1985; (contain detailed results of projects). Natural Resources Management Center, Manila, Philippines.
44. Comparing coral reef survey methods. Report of a regional UNESCO/UNEP Workshop, Phuket Marine Biological Centre, Thailand, 13-17 December 1982. UNESCO Reports in Marine Science 21, 1984 (170 pages).
45. Coral taxonomy. Results and recommendations of a regional UNESCO (COMAR)/UNEP Workshop with advanced training, Phuket Marine Biological Centre, Thailand, 10 - 26 February 1984. UNESCO Reports in Marine Science 33, 1985. (37 pages).
46. Report of the ASEAN/UNEP Workshop on Standardization of Physical Oceanography Methods and Data in the East Asian Seas Area, Phuket, Thailand, 25 - 29 July 1983. (14 pages & 16 annexes).
47. Siripong, A. The hydrography of the South China Sea and the Gulf of Thailand.
Volume I. Geography and geology of the surrounding land. February 1985 (355 pages).
Volume II. Topography of land and sea bottom. March 1985. (248 pages).
Volume III. Hydrology and climatology. March 1985 (260 pages).
Volume IV. Wave, tide and current. April 1985 (253 pages).
Volume V. The characteristics of water masses (774 pages).
48. Suwanpong, S. Climate of the coastal areas surrounding the South China Sea. Meteorological Department Technical Document, Bangkok, Thailand (1985) (57 pages).

49. Report of the ASEAN/UNEP Workshop on Information and Data Exchange on the Seas of East Asia, Jakarta, Indonesia, 17 - 19 March 1983 (6 pages & 11 annexes).
50. Report of the Regional Technical Meeting on Monitoring of Oil Pollution in the Seas of East, Jakarta, Indonesia, 9 - 10 August 1983 (7 pages & 5 annexes).
51. Siripong, A. Manual on the compilation and exchange of marine environment data and information in the East Asian Seas. December 1983 (280 pages).
52. Report of the Consultative Meeting on Information and Data Exchange on the Seas of East Asia; Sanur, Bali, Indonesia, 17 - 19 March 1986. (9 pages & 10 annexes).
53. Report on the First Meeting of Participating National Institutes on EAS Project 3: Assessment of Non-Oil Pollution, Metro Manila, 14 - 17 February 1983 (15 pages & 3 annexes).
54. Proceedings of the Workshop on Environmental Monitoring (trace metals), Quezon City, Philippines, 28 May - 8 June 1984. (42 pages & 3 annexes).
55. Report of COBSEA Workshop on Cleaning Up of Urban Rivers, Singapore, 14 - 16 January 1986 (21 pages & 12 annexes).

Annex II

NATIONAL FOCAL POINTS FOR THE ACTION PLAN

Brunei Darussalam

H.E. The Permanent Secretary
Ministry of Foreign Affairs
Bandar Seri Begawan
Brunei Darussalam

Indonesia

Mr. Herman Haeruman
Assistant Minister
Ministry of State for Population and the Environment
Jl. Merdeka Barat 15
Jakarta, Indonesia

Tel: (0) 37 43 07
(R) 79 77 19
(Kantor Menteri Negara)
(K.L.H.)
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UNDP, Jakarta)

Malaysia

Mr. A. Maheswaran
Director-General
Department of Environment
Ministry of Science, Technology and Environment
13th Floor, Wisma Sime Darby
Jalan Raja Laut
50662 Kuala Lumpur
Malaysia

Tel: 03-2936886/2938955
Tlx: MA 28154 MOSTEC

Philippines

The Executive Director
National Environmental
Protection Council
6th Floor, PHCA Building
East Avenue, Diliman
Quezon City, Philippines

Tel: 98 04 21 Ex.2635/2619
Tel: Direct: 973254
Tlx: 2507 NEPC PU
Cable: ENVIRON MANILA

Singapore

Mr. Richard Lau
Deputy Secretary, Finance & Administration
Ministry of the Environment
40 Scotts Road
Singapore 0922
Singapore

Tel: 732 7733
Tlx: MOE RS34365
Cable: MINENVIRON SINGAPORE

Thailand

Mr. Pravit Ruyabhorn,
Secretary-General
National Environment Board
Soi Pracha - Sumpun 4
Rama VI Road
Bangkok 10400
Thailand

Tel: 279 0129
Tlx: 20838 MINSTEN TH
Cable: NALENBO BANGKOK 10400

Annex III

MEETINGS CONVENED IN THE FRAMEWORK OF THE ACTION PLAN

A. <u>Preparatory meetings:</u>	<u>No. of Participants</u>	<u>Activity code</u>
1. IOC/FAO(IPFC)/UNEP International Workshop on Marine Pollution in East Asian Waters, Penang, 7-13 April 1976 Report: IOC Workshop Report No.8, UNESCO, 1976	20	EAS-1
2. WHO/UNEP Regional Seminar on Environmental Health Impact Assessment, New Delhi, 8-12 October 1979 Report: WHO/SEA/EH/235, 1980	20	EAS-4
3. Workshop on Coastal Area Development and Management in Asia and the Pacific, Manila, 3-12 December 1979 Report: Proceedings of the Workshop on Coastal Area Development and Management in Asia and the Pacific East-West Center, 1981	46	EAS-5
4. IMCO/UNEP Meeting on the Development of Sub-regional Oil-Spill Contingency Arrangements in the Celebes (Sulawesi) Sea, Jakarta, 7-9 January 1980 Report: IMCO/OSCA/5, 1980	18	EAS-2
5. FAO/UNEP (in collaboration with UNESCO and IUCN) Expert Consultation Meeting on Impact of Pollution on the Mangrove Ecosystem and its Productivity in Southeast Asia, Manila, 4-8 February 1980 Report: UNEP/WG.41/INF.14, FAO/SCSP, 1980	11	EAS-3
6. FAO/UNEP (in collaboration with IOC) Expert, Consultation Meeting on Assessment of Oil Pollution and its Impact on Living Aquatic Resources in Southeast Asia, Manila, 11-15 February 1980 Report: UNEP/WG.41/INF.11, FAO/SCSP, 1980	10	EAS-10
7. Committee for Co-ordination of Joint Prospecting for Mineral Resources in Asian Offshore Areas (CCOP): <u>Ad hoc</u> Group Meeting on the Marine Environment, Bangkok, 20-25 March 1980 Report: CCOP/ROPEA-R.092, 1980	10	EAS-11

	<u>No. of Participants</u>	<u>Activity code</u>
8. UNESCO Expert Consultation on River Inputs to South-East Asian Seas, Jakarta, 2-4 June 1980 Report: UNEP/WG.41/INF.9, UNESCO, 1980	5	EAS-6
9. IMCO/UNEP International Workshop on the Prevention, Abatement and Combating of Pollution from Ships in East Asian Waters, Manila, 3-8 November 1980 Report: UNEP/WG.52/INF.10, 1980	40	EAS-2
10. First Meeting of Experts to Review the Draft Action Plan for the East Asian Seas, Baguio, 17-22 June 1980 Report: UNEP/WG.41/4, 1980	32	EAS-Gen
11. Second Meeting of Experts to Review the Draft Action Plan for the East Asian Seas, Bangkok, 8-12 December 1980 Report: UNEP/WG.52/6, 1980	29	EAS-Gen
8. <u>Intergovernmental meetings:</u>		
1. Intergovernmental Meeting on the Protection and Development of the Marine Environment and Coastal Area of the East Asian Region, Manila, 27-29 April 1981 Report: UNEP/IG.26/6	36	EAS-Gen
2. Intergovernmental Meeting on the East Asian Seas Action Plan, Bangkok, 9-11 December 1981 Report: UNEP/IG.31/6	31	"
3. First Meeting of the Co-ordinating Body on the Seas of East Asia (COBSEA), Bangkok, 3 April 1982 Report: UNEP/IG.37/10	26	"
4. Second Meeting of the Co-ordinating Body on the Seas of East Asia (COBSEA), Yogyakarta, 25-26 March 1983 Report: UNEP/IG.44/11	35	"
5. Third Meeting of the Co-ordinating Body on the Seas of East Asia (COBSEA), Genting Highlands, 5-6 April 1984 Report: UNEP/IG.52/10	28	"

	<u>No. of Participants</u>	<u>Activity code</u>
6. Fourth Meeting of the Co-ordinating Body on the Seas of East Asia (COBSEA), Metro Manila, 22-23 April 1985 Report: UNEP/IG.62/12	28	"
7. Fifth Meeting of the Co-ordinating Body on the Seas of East Asia (COBSEA), Singapore, 25-26 April 1986 Report: UNEP/IG.65/12	32	EAS-Gen
C. <u>Technical meetings of the Action Plan:</u>		
1. UNESCO/UNEP Workshop on Coral Reef Survey, Management and Assessment Methods in Asia and the Pacific, Phuket, 13-17 December 1982 Report: UNESCO Reports in Marine Science No.21, 1984	24	EAS-13
2. First Meeting of Participating National Institutes on EAS Project 3: Assessment of Non-Oil Pollution, Quezon City, 14-17 February 1983 Report issued by organizers	8	EAS-16
3. First Workshop of Participating National Institutes on EAS Project 7: Information and Data Exchange, Jakarta, 17-19 March 1983 Report issued by organizers	23	EAS-15
4. Workshop on Standardization of Physical Oceanography Methods and Data in the East Asian Seas Area, Phuket, 25-29 July 1983 Report issued by organizers	21	EAS-14
5. Regional Technical Meeting on Project EAS 2.1: Survey of Sources and Monitoring of Oil Pollution, Jakarta, 9-10 August 1983 Report issued by organizers	10	EAS-15
6. UNESCO(COMAR)/UNEP Coral Taxonomy Workshop and Training Course, Phuket, 10-26 February 1984 Report: UNESCO Reports in Marine Science No.33, 1985	15	EAS-13
7. UNEP/ESA Regional Workshop on Toxicity Testing of Oil and Oil Dispersants, 9 Penang, 26 March-6 April 1984 Report issued by organizers		EAS-12

	<u>No. of Participants</u>	<u>Activity code</u>
8. Workshop on Environmental Monitoring: Trace Metals Analysis Quezon City, 28 May-4 June 1984 Report issued by organizers	15	EAS-16
9. Review Meeting of UNEP/EAS Project 2.2: Co-operative Research on Oil and Oil Dispersant Toxicity Testing, Sydney, 18-22 November 1985 Report issued by organizers	8	EAS-12
10. COBSEA Workshop on Cleaning Up of Urban Rivers, Singapore, 14-16 January 1986 Report issued by organizers	22	EAS-18
11. Consultative Meeting on Information and Data Exchange on the Seas of East Asia, Bali, 17-19 March 1986 Report issued by organizers	11	EAS-15
12. UNEP/UNESCO Coral Taxonomy Workshop and Training Course II, Bolinao, 12-21 May 1986 Report: (In preparation)	32	EAS-13
13. UNEP/UNESCO Workshop on Methods of Visual Census of Coral Fisheries, Bolinao, 22-25 May 1986 Report: (In preparation)	18	EAS-13
14. SPREP/UNEP/IOC/COBSEA Workshop on Organochlorines, Port Moresby, 23 June-4 July 1986 Report: (In preparation)	6	EAS-16
15. Joint Survey in the Strait of Malacca, Pulau Sambu, 21-27 August 1986	14	EAS-15

Annex IV

INTERNATIONAL AND NATIONAL INSTITUTIONS WHICH PARTICIPATED IN
THE DEVELOPMENT AND IMPLEMENTATION OF THE ACTION PLAN

<u>A. International organizations:</u>	<u>Activity code</u>
United Nations Department of International Economic and Social Affairs United Nations N.Y. 10017 New York United States of America	EAS-5
Economic and Social Commission for Asia and the Pacific United Nations Building Rajdamnern Avenue Bangkok Thailand	EAS-5, 11
Food and Agriculture Organization of the United Nations Via delle Terme di Caracalla 00100 Rome Italy	EAS-1, 3, 10
United Nations Educational, Scientific and Cultural Organization 7 Place de Fontenoy 75700 Paris France	EAS-6
World Health Organization 20 Avenue Appia 1211 Geneva 27 Switzerland	EAS-4, 8
International Maritime Organization 7 Albert Embankment London SE1 7RS United Kingdom	EAS-2, 7
International Atomic Energy Agency International Laboratory of Marine Radioactivity Musee Oceanographique Principality of Monaco	EAS-16
Intergovernmental Oceanographic Commission UNESCO 7 Place de Fontenoy 75700 Paris France	EAS-1

Activity code

Committee for Co-ordination of Joint Prospecting for Mineral
Resources in Asian Offshore Areas
c/o ESCAP
United Nations Building
Rajadamnern Avenue
Bangkok 2
Thailand

EAS-11

B. National institutions:

Indonesia

Ministry of State for Population and Environment (K.L.H.)
Jalan Medan Merdeka Barat 15
Jakarta Pusat

EAS-11, 15, 16, 17, 18

Centre for Oceanological Research and Development
(Puslitbang Oceanologi-LIPI)
Jalan Pasir Putih No.1
Ancol Timur
P.O. Box 580 Dak
Jakarta Utara

EAS-3, 8, 10, 13, 14, 15,
16

National Scientific Documentation Centre
Indonesian Institute of Sciences (L.I.P.I.)
P.O. Box 3065 JKT
Jalan Gatot Subroto
Jakarta

EAS-15

Oil and Gas Technology Development Centre "LEMIGAS"
Cipulir, Kebayoran Lama
P.O. Box 89 JKT
Jakarta Selatan

EAS-10, 11, 12, 15, 16

Indonesian Petroleum Institute
P.O. Box 89 JKT
Cipulir
Jakarta

EAS-1

Marine Fisheries Research Institute
Jalan Kerapu 12
Sunda Kelapa
Jakarta

EAS-3, 15

Ministry of Public Works
Institute of Hydraulic Engineering
Division of Environmental Water Quality
Jl. Ir. H. Juanda 193
Bandung

EAS-4, 16, 18

Naval Hydro-Oceanographic Office
87 Gunung Sahari
Jakarta Pusat

EAS-14, 15

Activity code

Directorate General of Oil and Gas
Jalan M.H.Thamrin 1
Jakarta

EAS-15

Directorate General of Sea Communications
Sub Directorate for Marine Pollution
Jalan Medan Merdeka Timur 5
Jakarta Pusat

EAS-15, 17

Chemistry and Environment Laboratory
Centre for the Application of Isotopes and Radiation
Pasar Jumat
P.O. Box 2
Kebayoran Lama
Jakarta Selatan

EAS-16

Malaysia

Ministry of Science, Technology and Environment
13th Floor, Wisma Sime Darby
Jalan Raja Laut
50662 Kuala Lumpur

EAS 2, 6, 8, 11, 12, 15,
16, 17, 18

Universiti Pertanian Malaysia
Faculty of Fisheries and Marine Science
Serdang, 43000 Selangor

EAS-13, 14

Fisheries Research Institute
Calthrop Road
11700 Glugor, Penang

EAS-1, 3, 10, 12, 13, 15,
16

Ministry of Health
Jalan Young
50590
Kuala Lumpur

EAS-1, 6

Universiti Malaya
Lembah Pantai
59100 Kuala Lumpur

EAS-3, 6

Universiti Sains Malaysia
Minden
11800 Penang

EAS-10

Malaysian Meteorological Service
Jalan Sultan
Petaling Jaya, Selangor
46667 Kuala Lumpur

EAS-14

Hydrographic Department
Department of Navy
Ministry of Defence
Jalan Padang Tembak
50634 Kuala Lumpur

EAS-14

Activity code

Department of Sewerage and Drainage
City Hall
50350 Kuala Lumpur

EAS-18

Philippines

National Environmental Protection Council
6th Floor, PHCA Building
East Avenue,
Diliman, Quezon City

EAS-2, 8, 15, 16, 17, 18

Bureau of Fisheries and Aquatic Resources
Arcadia Building
Quezon Avenue
Quezon City

EAS-3, 11, 13, 14

Natural Resources Management Center
8th Floor, Triumph Building
1610 Quezon Avenue
Quezon City

EAS-13

Marine Science Institute
University of the Philippines
Diliman, Quezon City

EAS-3, 11, 13, 14

National Pollution Control Commission
727 Pedro Gil Street
Malate, Manila

EAS-1, 2, 8, 16

Philippine Atomic Energy Commission
Commonwealth Avenue
Diliman, Quezon City

EAS-11, 16

Philippine Institute for Pure and Applied Chemistry
Ateneo de Manila University
Loyola Heights
Diliman, Quezon City

EAS-16

Bureau of Coast and Geodetic Survey
San Nicolas, Binondo
Manila

EAS-14

Silliman University
Marine Laboratory
Dumaguete City

EAS-13

University of the Philippines Los Banos
College of Science and Humanities
Department of Chemistry
College, Laguna

EAS-1

Activity code

National Operations Centre for Oil Pollution (NOCOP)
Philippine Coast Guard
25th Street
Port Area
Metro Manila

EAS-2, 10, 12

Mangrove Research Centre
Talipan
Pagbilao
Quezon

EAS-3

Singapore

Ministry of the Environment
40 Scotts Road
Singapore 0922
Singapore

EAS-6, 15, 16, 18

National University of Singapore
Lower Kent Ridge Road
Singapore 0511

EAS-3, 10, 13, 15, 16

Port of Singapore Authority
P.O. Box 300
Singapore

EAS-2, 17, 18

Ministry of National Development
Maxwell Road
Singapore

EAS-18

Ministry of Law
City Hall
St. Andrews Road
Singapore

EAS-18

Thailand

National Environment Board
60/1 Soi Prachasumpan IV
Rama VI Road
Bangkok 10400

EAS-2, 4, 8, 11, 14, 15, 16,
17, 18

Phuket Marine Biological Centre
Department of Fisheries
P.O. Box 60
Phuket 83000

EAS-12, 13

Prince of Songkla University
Department of Biology
P.O. Box 3, Ko Hong
Haad Yai
Songkla 90112

EAS-13

Activity code

Srinakarinviroj University
Bang Saen Campus
Cholburi

EAS-13

Sichang Marine Science Research Institute
Sichang Island
Cholburi 20120

EAS-13

Royal Thai Navy
Hydrographic Department
Aroonammarin Road
Bangkok 10600

EAS-14

Chulalongkorn University
Marine Science Department
Faculty of Science
Phaya Thai Road
Bangkok 10500

EAS-1, 3, 8, 11, 13, 14, 15,
16

Department of Fisheries
Ratchadumnern Avenue
Bangkok 10200

EAS-3, 13, 14

Harbour Department
Yota Road, Sampantavong District
Bangkok 10100

EAS-14, 17

Applied Scientific Research Corporation of Thailand
196 Phonyothin Road
Bangkhen
Bangkok

EAS-1-

Department of Industrial Works
Ministry of Industry
Bangkok

EAS-16

Department of Fisheries,
Oceanographic Section Laboratory
Exploratory Fishing Division
Sri Samut Road
Samutprakarn
Bangkok

EAS-16

Asian Institute of Technology
Division of Water Resources Engineering
Box 2754
Bangkok 10501

EAS-14

Annex V

TRAINING PROVIDED THROUGH THE ACTION PLAN

This annex contains information on national experts who benefited from individual or group training, including from participation in meetings which were wholly or partially held to improve the capability of participants to deal with environmental problems.

A. INDIVIDUAL TRAINING

A. Siripong (Thailand)

Training and study tour on oceanographic data processing at University of Kyoto (Japan), University of Vancouver (Canada), Woods Hole Oceanographic Institutions (USA), World Oceanographic Data Centre (USA) and UNEP (Switzerland), (31 March - 8 May 1983). Relevant to activity EAS-14.

S. Boonyapiwat (Thailand)

Training and study tour on oceanographic data processing at University of Kyoto (Japan), University of Vancouver (Canada), Woods Hole Oceanographic Institutions (USA), World Oceanographic Data Centre (USA) and UNEP (Switzerland), (31 March - 8 May 1983). Relevant to activity EAS-14.

B. GROUP TRAINING

EAS-1

IOC/FAO(IPFC)/UNEP International Workshop on Marine Pollution in East Asian Waters
Penang, Malaysia, 7 - 13 April 1976

C.R. Barril (Philippines)
A.R. Basu (India)
J. Bilal Jr. (Indonesia)
B. Garcia (Philippines)
M. Hungspreugs (Thailand)
V. Ilyichev (USSR)
A.A. Jothy (Malaysia)
A.F. Kapauan (Philippines)
K.Y. Kim (Korea)
P. Menasveta (Thailand)

B.S. Morton (Hong Kong)
H. Nishimura (Japan)
J.E. Ong (Malaysia)
S. Ratasuk (Thailand)
A. Sekarajasekaran (Malaysia)
R. Sen Gupta (India)
H. Sudo (Japan)
G.B. Thompson (Hong Kong)
S.J. Thrower (Australia)
T. Yoshida (Japan)

EAS-4

WHO/UNEP Regional Seminar on Environmental Impact Assessment
New Delhi, India, 8 - 12 October 1979

Q.A.M.M. Naquib (Bangladesh)
M.A. Karim (Bangladesh)
F.K. Chowdhury (Bangladesh)
P.K. Chatterjee (India)
B.N. Rahalkar (India)
K.R. Ranganathan (India)
S. Sanudi (Indonesia)
S.S. Soesanto (Indonesia)
N. Makarim (Indonesia)
A. Sattar Yoosuf (Maldives)

E. Banzar (Mongolia)
S. Duguitsagan (Mongolia)
M.M. Joshi (Nepal)
G.M. Shrestha (Nepal)
M. Rodrigo (Sri Lanka)
K.A. Wijeratne (Sri Lanka)
S. Kulasingham (Sri Lanka)
P. Charuchandr (Thailand)
C. Pongpanich (Thailand)
S. Boriboon (Thailand)

EAS-5

Workshop on Coastal Area Development and Management in Asia and the Pacific
Manila, Philippines, 3 - 12 December 1979

Chen Degong (China)
Wang Daxiong (China)
R.N. Richmond (Fiji)
P.E. Hehanussa (Indonesia)
I. Usna (Indonesia)
O.S.R. Ongkosongo (Indonesia)
T. Apandi (Indonesia)
Choong Tet Foong (Malaysia)
Khoo Han Peng (Malaysia)
G. Anderson (Papua New Guinea)
J.C. Fernandez (Philippines)
F.A. Comsti (Philippines)
O.A. Crispin (Philippines)
R. Umali (Philippines)
A. Bernabe (Philippines)
R. Biña (Philippines)
E. Deocadiz (Philippines)
M.D. Lopez (Philippines)
S. Martin (Philippines)
J. Miguel-Gonzales (Philippines)
R. Pajaro (Philippines)
C. Pascual (Philippines)
F. Pili (Philippines)
R.M. Relova (Philippines)

R. Rieza (Philippines)
P.P. Viray (Philippines)
P.M. Zamora (Philippines)
A. Bravo (Philippines)
A. de Jesus (Philippines)
D.P. Fajardo (Philippines)
D. Guerrero (Philippines)
D. Marquez (Philippines)
L. Peralta (Philippines)
M.E. Placido (Philippines)
M.F. Sioson (Philippines)
Jae Pil Kim (Korea)
Sung-Woo Kim (Korea)
Lim Joo Ngee (Singapore)
J. Ridgway (Solomon Islands)
T. Ruangchotivit (Thailand)
Y. Sinthupinyo (Thailand)
E. Ngiraelbaed (Trust Territories of
the Pacific Islands)
K. Yamada (Trust Territories of the
Pacific Islands)
Dao Duy Chu (Vietnam)
Le Thac Xinh (Vietnam)
C.A.Y. Hewson (Western Samoa)

EAS-2

IMCO/UNEP Meeting on the Development of Sub-Regional Oil-Spill Contingency Arrangements
in the Celebes (Sulawesi) Sea

Jakarta, Indonesia, 7 - 9 January 1980

R.U. Sukaton (Indonesia)
W. Menayang (Indonesia)
N. Wisnumurti (Indonesia)
P.L. Coutrier (Indonesia)
R. Robbani (Indonesia)
R. Wiradisuria (Indonesia)
M. Danusaputro (Indonesia)
C. Rasjid (Indonesia)
R. Mustadjab (Indonesia)

A.I. Bachtiar (Indonesia)
Mr. Kuntadi (Indonesia)
H.G. Sangkilawang (Indonesia)
R.E. Soeriaatmadja (Indonesia)
M. S.B. Samsudin (Malaysia)
M.S. Osman (Malaysia)
J.M. Casillan (Philippines)
A.F. Bernabe (Philippines)
E.L. Mandapat (Philippines)

EAS-3

FAO/UNEP (in Collaboration with UNESCO and IUCN) Expert Consultation Meeting on Impact
of Pollution on the Mangrove Ecosystem and its Productivity in Southeast Asia

Manila, Philippines, 4 - 8 February 1980

C.A. Arroyo (Philippines)
E.D. Gomez (Philippines)
I. Ronquillo (Philippines)
Chia Lin Sien (Singapore)
Khoo Hong Woo (Singapore)
Ong Kah Sin (Malaysia)

A. Sasekumar (Malaysia)
T. Piyakarnchana (Thailand)
A. Saraya (Thailand)
A. Soegiarto (Indonesia)
M. Unar (Indonesia)

EAS-3

FAO/UNEP (in Collaboration with IOC) Expert Consultation Meeting on Assessment of Oil
Pollution and its Impact on Living Aquatic Resources in Southeast Asia

Manila, Philippines, 11 - 15 February 1980

B.N. Garcia (Philippines)
E.L. Mandapat (Philippines)
M.R.L. Petel (Philippines)
J. Bilal (Indonesia)
A. Soegiarto (Indonesia)

Chia Lin Sien (Singapore)
Chua Thia Eng (Malaysia)
A.A. Jothy (Malaysia)
P. Menasveta (Thailand)
G.B. Thompson (Hong Kong)

EAS-11

Committee for Co-ordination of Joint Prospecting for Mineral Resources in Asian
Offshore Areas (CCOP) Ad hoc Group Meeting on the Marine Environment
Bangkok, Thailand, 20 - 25 March 1980

W. Wisaksono (Indonesia)	P. Limcharoen (Thailand)
Z. Said (Malaysia)	S. Sampattavanija (Thailand)
M.C. Berbano (Philippines)	W. Techasurungkul (Thailand)
C. Kuttan (Singapore)	Y. Tongpenyai (Thailand)
P. Suwanasing (Thailand)	S. Piamphongsant (Thailand)

EAS-6

UNESCO Expert Consultation on River Inputs to Southeast Asian Seas
Jakarta, Indonesia, 2 - 4 June 1980

P. Charuchandr (Thailand)	G. Singam (Malaysia)
A.C. Diaz (Philippines)	V.R. Pantulu (Thailand)
B. Mahbub (Indonesia)	

EAS-Gen

Meeting of Experts to Review the Draft Action Plan for the East Asian Seas
Baguio, Philippines, 17 - 21 June 1980

H. Haeruman (Indonesia)	B. M. Balbon (Philippines)
A. Soegiarto (Indonesia)	O. Castro (Philippines)
J. Bilal (Indonesia)	I. Esteban (Philippines)
P.L. Coutrier (Indonesia)	B. Lomotan (Philippines)
T. Sutrisno (Indonesia)	A. Bernabe (Philippines)
A.B. Haji Maamor (Malaysia)	T. Aquino (Philippines)
A.B. Bin Jaafar (Malaysia)	M. Berbano (Philippines)
Y. Bin Tahir (Malaysia)	K. Chitharanjan (Singapore)
C.R. Roque (Philippines)	Teh Kong Leong (Singapore)
V.R. Villavicencio (Philippines)	K. Tan (Singapore)
A. Tolentino Jr. (Philippines)	P. Kiravanich (Thailand)
B. Balagot (Philippines)	M. Duangsawasdi (Thailand)
H. Talavera (Philippines)	P. Tasneeyanond (Thailand)
R. Umali (Philippines)	M. Hungspreugs (Thailand)
R. Biña (Philippines)	A.H. Viswanatha Sarma (Thailand)
G. Trono Jr. (Philippines)	C. Polprasert (Thailand)

EAS-2

IMCO/UNEP International Workshop on the Prevention, Abatement and Combating
of Pollution from Ships in East Asian Waters
Manila, Philippines, 3 - 8 November 1980

M. Shafi (Bangladesh)	J.L. Advincula (Philippines)
N. Ahmed (Bangladesh)	L.R. Torres (Philippines)
Shen Zhaoqi (China)	N. Naval (Philippines)
Wu Xichu (China)	I. Valasco (Philippines)
P.N. Batra (India)	G. Defensor (Philippines)
S.D. Batra (India)	A. Camp (Philippines)
R. Robbani Sh. (Indonesia)	E. Alpay (Philippines)
S. Rosadhi (Indonesia)	F.A. Arellano (Philippines)
P. Tan Hock Chuan (Malaysia)	R. Cruz (Philippines)
H.B.M. Noor (Malaysia)	R.C. Deriquito (Philippines)
Khong Shen Ping (Singapore)	R.D. Herrera (Philippines)
S.A. Perera (Sri Lanka)	V. Jucaban (Philippines)
A.K. Diyabalanage (Sri Lanka)	R.G. Magno (Philippines)
U. Uyasatian (Thailand)	M.R.L. Petel (Philippines)
P. Kaewamporn (Thailand)	E. Salanguit (Philippines)
N. Blancas (Philippines)	J. Tamayo (Philippines)
A.A. De Guzman (Philippines)	M.H. Bin Haji Yusof (Brunei)
A.F. Bernabe (Philippines)	Pengiran Hallid B.P. Mohammed (Brunei)
L.T. Ibañez (Philippines)	Ng Sheung Ying (Hong Kong)
J.M. Casillan II (Philippines)	Tsui Shung-Yiu (Hong Kong)

EAS-Gen

Second Meeting of Experts to Review the Draft Action Plan for the East Asian Seas
Bangkok, Thailand, 8 - 12 December 1980

P. L. Coutrier (Indonesia)	T. Pongsapipott (Thailand)
S.T. Sundram (Malaysia)	M. Hungspreugs (Thailand)
A. Maheswaran (Malaysia)	P. Tasneeyanond (Thailand)
G. Bin Mohd Haniffa (Malaysia)	M. Duangsawasdi (Thailand)
V. Villavicencio (Philippines)	P. Vongsamoot (Thailand)
A.S. Tolentino Jr. (Philippines)	K. Sindhusake (Thailand)
R.O. Juliano (Philippines)	S. Suwanpong (Thailand)
A.F. Kapauan (Philippines)	S. Yensuang (Thailand)
Chiang Kok Meng (Singapore)	P. Kantahiran (Thailand)
Gwee Hak Theng (Singapore)	P. Suwanasing (Thailand)
Low Keng Hwee (Singapore)	J. Kongsangchai (Thailand)
K. Snidvongs (Thailand)	C. Polprasert (Thailand)
A. Suphapodok (Thailand)	A.H. Viswanatha Sarma (Thailand)
D. Kisananuvat (Thailand)	P. Taranatham (Thailand)
S. Piamphongsant (Thailand)	

EAS-13

Fourth International Coral Reef Symposium
Manila, Philippines, 18 - 22 May 1981

J. Bure (Papua New Guinea)
A. Soegiarto (Indonesia)

S. Srithunya (Thailand)
S. Sudara (Thailand)

EAS-13

UNESCO/UNEP Workshop on Coral Reef Survey, Management and Assessment
Methods in Asia and the Pacific
Phuket, Thailand, 13 - 17 December 1982

A.C. Alcala (Philippines)
C. Birkeland (Guam)
Chou Loke Ming (Singapore)
M.W.R.M. De Silva (Malaysia)
E.D. Gomez (Philippines)
H. Chansang (Thailand)
Dr. Sukarno (Indonesia)
S. Sudara (Thailand)
A. Snidvongs (Thailand)
J. Tantivala (Thailand)
M. Charuchinda (Thailand)
N. Phongsuwan (Thailand)

P. Boonyanate (Thailand)
P. Suwanasing (Thailand)
P. Sukhavisidh (Thailand)
N. Brikshuand (Thailand)
P. Tantichodok (Thailand)
S. Petpiroon (Thailand)
S. Srithunya (Thailand)
S. Poovachiranon (Thailand)
S. Partaramata (Thailand)
S. Mongkolprasit (Thailand)
V. Janekarn (Thailand)
W. Lamwilai (Thailand)

EAS-Gen

15th Pacific Science Congress
Dunedin, New Zealand, 1 - 11 February 1983

J. Bilal (Indonesia)
H. Chansang (Thailand)
E. Gomez (Philippines)
M. Hungspreugs (Thailand)
A. Jothy (Malaysia)

A. Kapauan (Philippines)
A. Maheswaran (Malaysia)
K. Snidvongs (Thailand)
A. Soegiarto (Indonesia)
H. Yap (Philippines)

EAS-16

First Meeting of Participating National Institutes on EAS Project 3: Assessment
of Non-Oil Pollution
Quezon City, Philippines, 14 - 17 February 1983

R.T.M. Sutamihardja (Indonesia)
K. Romimohtarto (Indonesia)
A.M. Ibrahim (Malaysia)
H.R. de Leon (Philippines)

A.M. de la Rosa (Philippines)
A. Kapauan (Philippines)
S. Tridech (Thailand)
M. Hungspreugs (Thailand)

EAS-15

First Workshop of Participating National Institutes on EAS Project 7:
Information and Data Exchange

Jakarta, Indonesia, 17 - 19 March 1983

L. Pringgoadisurjo (Indonesia)
D.P. Praseno (Indonesia)
M.D. Aman (Indonesia)
S. Rawi (Indonesia)
P. Tan Hock Chuan (Malaysia)
Aminah Ali (Malaysia)
N.R. Castelo (Philippines)
S. Pase Jr. (Philippines)
Kuan Kwee Jee (Singapore)
W. Low Keng Hwee (Singapore)
A. Siripong (Thailand)
C. Indhanya (Thailand)

R.T. Sutamihardja (Indonesia)
S. Hudyastuti (Indonesia)
B. Ariaji (Indonesia)
B. Widyantoro (Indonesia)
N. Wiraatmadja (Indonesia)
S. Birowo (Indonesia)
A. Rachman (Indonesia)
M.T. Jusar (Indonesia)
S. Suyatin (Indonesia)
M. Hanafi (Indonesia)
T.P. Mualim (Indonesia)

EAS-14

Workshop on Standardization of Physical Oceanography Methods and Data in the East Asian Seas Area
Phuket, Thailand, 25 - 29 July 1983

Mr. Kastoro (Indonesia)
S. Ravi (Indonesia)
Lim Joo Tick (Malaysia)
Goh Siew Chong (Malaysia)
P. Vejjanukroh (Thailand)
C. Chetananda (Thailand)
V. Charusombat (Thailand)
S. Piamphongsant (Thailand)
W.T. McCabe (Thailand)
V. Hongskul (Thailand)
D. Srisaengthong (Thailand)

H. Chansang (Thailand)
C. Chuensri (Thailand)
S. Suvapepun (Thailand)
S. Silpipat (Thailand)
P. Limsaichol (Thailand)
C. Neelasri (Thailand)
V. Panpruk (Thailand)
N. Setti (Thailand)
M. Teinkarodjanakul (Thailand)
V. Kasemsuraya (Thailand)

EAS-15

Regional Technical Meeting on Project EAS 2.1 Survey of Sources and
Monitoring of Oil Pollution

Jakarta, Indonesia, 9 - 10 August 1983

W. Wisaksono (Indonesia)
A. Soegiarto (Indonesia)
E. Jasjfi (Indonesia)
Liong Pit Chong (Malaysia)
M. Radzuan Bin Yusof (Malaysia)

A.M. Villarroel (Philippines)
Khoo Hong Woo (Singapore)
Kwik Whei Lu (Singapore)
M. Hungspreugs (Thailand)
M. Tabucanon (Thailand)

EAS-Gen

First International Symposium on Integrated Global Ocean Monitoring
Tallin, USSR, 2 - 10 October 1983

E. Gomez (Philippines)

A. Siripong (Thailand)

EAS-13

UNESCO(COMAR)/UNEP Coral Taxonomy Workshop and Training Course
Phuket, Thailand, 10 - 26 February 1984

S. James (Micronesia)
Dr. Sukarno (Indonesia)
L. Sya'rani (Indonesia)
M.W.R.N. De Silva (Malaysia)
R.B.A. Rahman (Malaysia)
P.M. Alino (Philippines)
L.C. Alcala (Philippines)
H. Maniku (Maldives)

J. Sy (Philippines)
Chou Loke Ming (Singapore)
M. Kanakaratne (Sri Lanka)
A. Snidvongs (Thailand)
N. Phongsuwan (Thailand)
P. Sonchang (Thailand)
M. Charuchinda (Thailand)

EAS-12

UNEP/EAS Regional Training Workshop on Toxicity Testing of Oil and Oil Dispersants
Penang, Malaysia, 26 March - 6 April 1984

I. Bachtiar (Indonesia)
Mr. Wasilun (Indonesia)
U. Uyasatian (Thailand)
S. Petpiroon (Thailand)
R. T. Cruz (Philippines)

A. Tolentino (Philippines)
R. Ibrahim (Malaysia)
V. Murugan (Malaysia)
Sim Ah Bah (Malaysia)

EAS-16

Workshop on Environmental Monitoring: Trace Metals Analysis
Quezon City, Philippines, 28 May - 4 June 1984

Wong Foon Meng (Malaysia)
Liong Pit Chong (Malaysia)
Chow Peng Wai (Singapore)
P. Arriyavat (Thailand)
P.B. Uy (Philippines)
C.R. Ananthan (Singapore)
C. Kaluwin (Papua New Guinea)
A.M. Lecciones (Philippines)

S.H. Sukarsono (Indonesia)
H. Razak (Indonesia)
N. Balat (Papua New Guinea)
G. Kairabu (Papua New Guinea)
S. Boonchalermkit (Thailand)
A. Alfone (Philippines)
A. Edward (Guam)

EAS-13

UNEP Workshop on Interregional Co-operation for Coral Reef Assessment and Management
Tahiti, French Polynesia, 31 May 1985

H. Chansang (Thailand)

E. Gomez (Philippines)

EAS-12

Review Meeting of UNEP/EAS Project 2.2: Co-operative Research on Oil and Oil Dispersant
Toxicity Testing

Sydney, Australia, 18 - 22 November 1985

I. Bachtiar (Indonesia)
B. Widyantoro (Indonesia)
P. Kiravanich (Thailand)
S. Tridech (Thailand)

R. T. Cruz (Philippines)
E. V. Delarma (Philippines)
V. Murugan (Malaysia)
Sim Ah Bah (Malaysia)

EAS-18

COBSEA Workshop on Cleaning Up of Urban Rivers
Singapore, 14 - 16 January 1986

A.A.B. Bin Apong (Brunei Darussalam)
B. Mahbub (Indonesia)
B. Ariaaji (Indonesia)
A.B. Jaafar (Malaysia)
K. Ariyathavaratnam (Malaysia)
T. Mogol (Philippines)
F.A. Pascua, Jr. (Philippines)
A. Suphapodok (Thailand)
S. Pairoj-Boriboon (Thailand)
Chiang Kok Meng (Singapore)
Ang-Tan Seow Kiak (Singapore)

A.P. Gonsalves (Singapore)
Yap Kheng Guan (Singapore)
Teo Boo Teck (Singapore)
Loy Wei Sun (Singapore)
Tan Mong Heng (Singapore)
Tan Way Tong (Singapore)
Mak Kok Choong (Singapore)
Poon Im Hung (Singapore)
Cheong Kok Keong (Singapore)
Yuen Heng Mun (Singapore)
Ang Swee Kee (Singapore)

EAS-15

Consultative Meeting on Information and Data Exchange on the Seas of East Asia
Bali, Indonesia, 17 - 19 March 1986

L. Pringgoadisurjo (Indonesia)
H. Uktolseya (Indonesia)
D.P. Praseno (Indonesia)
E.J.S. Lahay (Indonesia)
A.A. Rasol (Malaysia)
M. Sulaiman (Malaysia)

A.G. Paquia (Philippines)
A.M. Lecciones (Philippines)
Lai Hon Kuan (Singapore)
M. Unkulvasapaul (Thailand)
K. Choeypun (Thailand)

EAS-13

UNEP/UNESCO Coral Taxonomy Workshop and Training Course II
Bolinao, Philippines, 12 - 21 May 1986

D.G. Itano (American Samoa)	V. P. Palaganas (Philippines)
F. Viyala Mei (Fiji)	S.V.D. Rosales (Philippines)
M. Naqasima (Fiji)	A. Rajasuriya (Sri Lanka)
R. Bagnis (French Polynesia)	P. Boonyanate (Thailand)
M.V. Mohideen Wafar (India)	S. Choonhabandit (Thailand)
A. Dermanwan (Indonesia)	N. Phongsuwan (Thailand)
L.T.X. Lalamentik (Indonesia)	Nguyen Huy Yet (Vietnam)
N.A. Muthiga (Kenya)	M.A.V. Cusi (Philippines)
E. Wong Fai-Hung (Malaysia)	N. Danetaras (Philippines)
A.R. Bin Latun (Malaysia)	F.Y. Guarin (Philippines)
R.B.A. Rahman (Malaysia)	V.V. Hilomen (Philippines)
D.D. Nhantumbo (Mozambique)	M.J.D. Mamaril (Philippines)
P.F. Holthus (New Caledonia)	L.A.B. Meñez (Philippines)
Li Jian (China)	Ma.V.P. Tambasen (Philippines)
L.C. Alcala (Philippines)	F. Tan Te (Philippines)
W.R. Y. Licuanan (Philippines)	C. Villanoy (Philippines)

EAS-13

UNEP/UNESCO Workshop on Methods of Visual Census of Coral Fisheries
Bolinao, Philippines, 22 - 25 May 1986

M. Naqasima (Fiji)	S. Usavajitanon (Thailand)
A. Dermawan (Indonesia)	A. Rajasuriya (Sri Lanka)
M. Hutomo (Indonesia)	D.G. Itano (American Samoa)
D. Soedharma (Indonesia)	R. Bagnis (French Polynesia)
E. Wong Fai-Hung (Malaysia)	N.A. Muthiga (Kenya)
E.C. Barretto (Philippines)	P.F. Holthus (New Caledonia)
T.F. Luchavez (Philippines)	V.T. Antonio (Philippines)
F.S. Matillano (Philippines)	A. del Norte (Philippines)
F. Tan Te (Philippines)	V.V. Hilomen (Philippines)

EAS-16

SPREP/UNEP/IOC/COBSEA Workshop on Organochlorines
Port Moresby, Papua New Guinea, 23 June - 4 July 1986

G. Denton (Australia)	L.Y. Ching (Malaysia)
S. Shuyan (China)	I. Cabrera (Northern Mariana Islands)
W. Chipei (China)	P. Haie (Papua New Guinea)
N. Keshni (Fiji)	M. Kapush (Papua New Guinea)
R. Prasad (Fiji)	M.E.R. Cabral (Philippines)
J. Ledua (Fiji)	A. Maglaya (Philippines)
J.-L. Denardi (French Polynesia)	M. Tabucanon (Thailand)
C. Hardina (Guam)	G. Wattayakorn (Thailand)
E. Suwandi (Indonesia)	S. Pone (Tonga)
J. Oh (Korea)	

EAS-16

Workshop on Organochlorine Intercalibration
Papua New Guinea, 23 June - 4 July 1986

(List of participants could not be obtained from the organizers)

EAS-15

Joint Survey in the Strait of Malacca
Puala Sambu, Indonesia, 21-27 August 1986

J. Bilal (Indonesia)
M. Mulyono (Indonesia)
B. Prasetyo (Indonesia)
S. Devi (Malaysia)
Z. A. Rahman (Malaysia)
L. L. Pascual (Philippines)
F. S. Pascua, Jr. (Philippines)

Kok Poon Sing (Singapore)
C. Siriwong (Thailand)
P. Limpsaichol (Thailand)
E. Tambunan (Indonesia)
Mr. Susilo (Indonesia)
Mr. Soehartono (Indonesia)
Mr. Azhar (Indonesia)

Annex VI

TECHNICAL ASSISTANCE PROVIDED THROUGH THE ACTION PLAN

(a) Equipment

EAS-12

12 x Laboratory stirrer	Fisheries Research Institute, Malaysia
5 x Stirrer, motor	Phuket Marine Biological Centre, Thailand
10 x Experimental Glass tank Capacity 30 litre with standard accessories	Phuket Marine Biological Centre, Thailand

EAS-13

Nikonos IV-A underwater camera	Natural Resources Management Center, Philippines
2 x Conshelf regulators	Natural Resources Management Center, Philippines
Digital pH meter	Natural Resources Management Center, Philippines
Refrigerator (Westinghouse)	Natural Resources Management Center, Philippines
Sunpack underwater strobe	Natural Resources Management Centre, Philippines
Swift Stereozoom microscope	Natural Resources Management Centre, Philippines
La Motte water quality analyser	Natural Resources Management Centre, Philippines
IBM PC/XT Compatible	Natural Resources Management Centre, Philippines
Briggs 2 Stratton compressor motor	Natural Resources Management Centre, Philippines
Ryan thermograph	Marine Science Institute, University of the Philippines
Salinity refractometer	Marine Science Institute, University of the Philippines
Aquarius regulator	Marine Science Institute, University of the Philippines
Nikonos IV-A underwater camera	Marine Science Institute, University of the Philippines
Sunpack underwater strobe	Marine Science Institute, University of the Philippines

EAS-14

3 x SD-2000 Current meters with cases	National Environment Board, Thailand
Readout head	National Environment Board, Thailand
Field logger	National Environment Board, Thailand

(L) Experts

EAS-12

- G. Thompson (Australia) UNEP/EAS Regional training workshop on toxicity testing of oil dispersant
(Penang, 26 March - 6 April 1984)
- G. Thompson (Australia) Resource person, Review meeting on oil and dispersant toxicity testing
(Sydney, 18-22 November 1985)
- J. Chapman (Australia) Resources person, Review meeting on oil and oil dispersant toxicity testing
(Sydney, 18-22 November 1985)
- A. A. Jothy (Malaysia) Resource person, Review meeting on oil and oil dispersant toxicity testing (Sydney, 18-22 November 1985)
- C. M. Noor (Malaysia) Resources person, Review meeting on oil and oil dispersant toxicity testing (Sydney, 18-22 November 1985)

EAS-13

- C. Birkeland (Guam) Presentor, Coral Reef survey workshop
(Thailand, 13-17 December 1982)
- H. Chansang (Thailand) Presentor, Coral reef survey workshop
(Thailand, 13-17 December 1982)
- L. M. Chou (Singapore) Presentor, Coral Reef survey workshop
(Thailand, 13-17 December 1982)
- M.W.R.N. de Silva (Malaysia) Presentor, Coral Reef Survey workshop
(Thailand, 13-17 December 1982)
- A.C. Alcala (Philippines) Presentor, Coral Reef Survey workshop
(Thailand, 13-17 December 1982)
- Sukarno (Indonesia) Presentor, Coral Reef Survey workshop
(Thailand, 13-17 December 1982)
- J. R. E. Harger (UNESCO) Presentor, Coral Reef Survey workshop
(Thailand, 13-17 December 1982)
- A. White (U.S.A) Assessment of coral reef communities
in marine reserve (Philippines, 1983)
- G. Russ (Australia) Assessment of coral reef fish stocks
in a marine reserve (Philippines, 1984)
- Instructor, Methods of reef fish visual census
workshop
(Philippines, 22-25 May 1986)

- R. Miclat (Philippines) Asst. Instructor, Methods of reef fish visual census workshop (Philippines, 22-25 May 1986)
- J.E.M. Verson (Australia) Instructor, Coral taxonomy workshop I (Thailand, 10-26 February 1984) and Instructor, Coral taxonomy workshop II (Philippines, 12-21 May 1986)
- C. Wallace Instructor, Coral taxonomy workshop I (Thailand, 10-26 February 1984) and Instructor, Coral taxonomy workshop II (Philippines, 12-21 May 1986)
- G. Hodgson (U.S.A) Asst. Instructor, Coral taxonomy workshop II (Philippines, 12-21 May 1986)

EAS-14

- R. Radok (Australia) Honorary advisor to oceanography project
Advisor to oceanography project
(Thailand, 1984-1985)
- H. R. Frey (U.S.A) Lecturer for oceanography workshop
(Thailand, 25 - 29 July 1983)
- P. R. Hadsell (U.S.A) Lecturer for oceanography workshop
(Thailand, 25 - 29 July 1983)
- S. Suwanpong (Thailand) Lecturer for oceanography workshop
(Thailand, 25-29 July 1983)
- A. Siripong (Thailand)

EAS-16

- A. Kapauan (Philippines) Project consultant and workshop director: trace metals analysis
- B. Oregioni (Italy) Resource person for workshop on trace metals analysis
(Philippines, 28 May - 4 June 1984)
- N. Mantaño (Philippines) Resources person for workshop on trace metals
(Philippines, 28 May - 4 June 1984)
- G. Jacinto (Philippines) Resource person for workshop on trace metals analysis
(Philippines, 28 May - 4 June 1984)
- A. Maglaya (Philippines) Resource person for workshop on trace metals analysis
(Philippines, 28 May - 4 June 1984)
- J. Uthe (Canada) Resource person, Workshop on organochlorines
(Port Moresby, 23 June - 4 July 1986)
- K. Burns (U.K) Instructor at Workshop on Organochlorines
(Papua New Guinea 23 June - 4 July 1986)

C. Musial (Canada)	Resource person, Workshop on organochlorines (Port Moresby, 23 June - 4 July 1986)
J. Duinker (West Germany)	Resources person, Workshop on organochlorines (Port Moresby, 23 June - 4 July 1986)
R. Drysdale (Australia)	Resources person, Workshop on organochlorines (Port Moresby, 23 June - 4 July 1986)
A. Baria (PNG)	Resources person, Workshop on organochlorines (Port Moresby, 23 June - 4 July 1986)
D. Mowbray (PNG)	Resources person, Workshop on organochlorines (Port Moresby, 23 June - 4 July 1986)

EAS-18

M. Fujiwara (Japan)	Resources person, COBSEA Workshop on Cleaning UP of Urban Rivers (Singaproe, 14-16 January 1986)
N. Chaudhuri (India)	Resources person, COBSEA Workshop on Cleaning Up of Urban Rivers (Singapore, 14-16 January 1986)