

ASSOCIATION OF SOUTHEAST ASIAN NATIONS

ASEAN STRATEGIC PLAN OF ACTION ON WATER RESOURCES MANAGEMENT



Australian Government
AusAID

ASEAN Australia Development Cooperation Programme -
Regional Partnership Scheme



ASSOCIATION OF SOUTHEAST ASIAN NATIONS

ASEAN STRATEGIC PLAN OF ACTION ON WATER RESOURCES MANAGEMENT



Australian Government

AusAID

**ASEAN Australia Development Cooperation Programme –
Regional Partnership Scheme**

The Association of Southeast Asian Nations (ASEAN) was established on 8 August 1967. The members of the Association are Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Viet Nam. The ASEAN Secretariat is based in Jakarta, Indonesia.

For inquiries, contact:

Public Affairs Office

ASEAN Secretariat

70A Jalan Sisingamangaraja

Jakarta 12110

Indonesia

Phone : (62.21) 724.3372, 726.2991

Fax : (62.21) 739.8234, 724.3504

E-mail : public@aseansec.org

General information on ASEAN appears on-line at the ASEAN website: www.aseansec.org

Cataloging-in-Publication Data

**ASEAN Strategic Plan of Action on Water Resources Management
Jakarta, ASEAN Secretariat, October 2005**

iv, 38p; 21 x 27.9cm

1. ASEAN - Strategic Plan of Action
2. Water Resources Management

ISBN: 0-643-09263-3

Printed in Australia

The text of this publication may be freely quoted or reprinted with proper acknowledgement.

© Copyright ASEAN Secretariat 2005

All rights reserved

Cover Photos from ASEAN Photo Competition 2004:

Background Photo:

Keindahan Sungai Belalong (Muhamad Nazib bin Haji Jumat, Brunei Darussalam)

Photos (top-down):

1. Innlay Lake "Sea on the Mountain" (Yee Aung Htoo, Myanmar)
2. The Nature in the Early Rainy Season (Sin Chan Saya, Cambodia)
3. Food for Life from the Lake (Manilay S., Lao PDR)
4. Drinking Water (Sommay S., Lao PDR)
5. Vu Hai (Viet Nam)
6. Duc Huy (Viet Nam)

ACKNOWLEDGEMENTS

The ASEAN Secretariat gratefully acknowledges the financial support of the ASEAN-Australia Development Cooperation Programme - Regional Partnership Scheme and express our appreciation to the project team members (B. Haisman¹, K.S. Low², D. Roux³, G. Syme⁴ and A. Brecknell⁴) led by Dr. C. Chartres⁴ for assisting ASEAN in developing the ASEAN Strategic Plan of Action on Water Resources Management. We would also like to thank Dr. Salmah Zakaria of Global Water Partnership - Southeast Asia for her inputs during the preparation of this Report.

We also express our appreciation to the focal points from ASEAN Member Countries for their comments and inputs on the Strategic Plan of Action.

This Report was prepared under the direction and overall coordination of the Environment Unit of the ASEAN Secretariat.

¹ Independent Consultant

² Independent Consultant

³ Council for Scientific and Industrial Research (CSIR) South Africa

⁴ Commonwealth Scientific and Industrial Research Organisation (CSIRO) Land and Water, Australia

Table of Contents

1	Vision	1
2	Mission	1
3	Context of the Plan	1
4	Objectives	3
5	Process of Plan Development	4
6	Governing Principles	4
7	State of Water Resources Management in ASEAN	5
8	Key Issues	6
8.1	Supply, Demand and Allocation	6
8.2	Water Quality and Sanitation.....	7
8.3	Climate Change and Extreme Events	8
8.4	Governance and Capacity Building	8
9	Project Portfolio to Underpin Strategy	9
9.1	Supply, Demand and Allocation	10
9.2	Water Quality and Sanitation.....	10
9.3	Extreme Events	10
9.4	Capacity Building and Governance	10
9.5	Expected Outcomes and Benefits from Implementation	10
9.6	Project Concept Implementation Process	11
Appendix 1: Project Concept Proposals		12
Project Concept 1:	Demand Management Learning Forums.....	12
Project Concept 2:	ASEAN IWRM Country Strategy Guidelines	13
Project Concept 3:	River Classification Systems	17
Project Concept 4:	ASEAN Water Data Management and Reporting System Design	19
Project Concept 5:	Risks and Impacts from Extreme Events in ASEAN Member Countries.....	23
Project Concept 6:	Knowledge Sharing and Exchange	27
Project Concept 7:	Exchanging Information and Creating Awareness in a Structured Basis between Peak Bodies	29
Project Concept 8:	Integrated Land Use Planning.....	31
Project Concept 9:	Increasing Long Term Awareness, Knowledge and Community Participation in Integrated Water Resource Management	33
Project Concept 10:	Education on Sanitation and Pollution Management.....	36

1 Vision

The vision for water resources in ASEAN was initially defined in the ASEAN Long Term Strategic Plan for Water Resources Management endorsed by ASEAN environment ministers in 2002. The vision for water in Southeast Asia by 2025 is:

“the attainment of sustainability of water resources to ensure sufficient water quantity of acceptable quality to meet the needs of the people of Southeast Asia in terms of health, food security, economy, and environment”.

The vision stipulates concern for four major aspects of water management:

- Access to safe, adequate and affordable water supply, hygiene and sanitation
- Provision of sufficient water that will ensure food security for the region
- Provision of sufficient water to spur and sustain the economies of the region
- Protection of the water environment to preserve flow regimes, biodiversity and cultural heritage as well as the mitigation of water-related hazards

2 Mission

To enhance understanding of the importance of water to the economy and livelihoods at all levels of society through implementation of world’s best practice integrated water resources management and capacity building.

3 Context of the Plan

This ASEAN Strategic Plan of Action on Water Resources Management was initiated by the ASEAN Working Group on Water Resources Management (AWGWRM).

The need for ASEAN to develop a regional water conservation programme was originally recognised in the Hanoi Plan of Action (1999-2004).

Based on a proposal from the AWGWRM, the 14th Meeting of ASEAN Senior Officials on the Environment (ASOEN) adopted the ASEAN Long Term Strategic Plan for Water Resources Management in July 2003. The Long Term Plan was then endorsed by the ASEAN environment ministers in December 2003. The Long Term Plan defined a number of challenges in the water area. These are shown in Table 1 in this report.

The 2nd Meeting of the AWGWRM, which was held on 21-22 November 2003 in Chiang Mai, Thailand, noted the Declaration of the 1st Southeast Asia Water Forum (17-21 November 2003, Chiang Mai, Thailand). The Forum Declaration, which recognises the strength of the ASEAN framework as a driver for development, recommends specific actions to be taken to further improve and advance better practices for water management in the region

The 2nd Meeting of the AWGWRM further noted the Chiang Mai Ministerial Declaration on Managing Water Resources in Southeast Asia which was adopted at the First Ministerial Meeting on Managing Water Resources in Southeast Asia held on 21 November 2003 in Chiang Mai, Thailand. The Chiang Mai Ministerial Declaration noted the problems of food security, inadequate access to safe and affordable drinking water and sanitation facilities for all, and the degradation of environment in catchments including freshwater and coastal waters.

The Forum recognised the need to integrate the management of water sectors and issues including water supply, sanitation, floods and droughts, degradation of the environment, food security, livelihoods of the poor, and that increasing variability is due to human intervention and changes in climate.

Table 1: ASEAN Long Term Strategic Plan of Action for Water Resources Management Challenges and Actions

Challenge	Action	Description
Challenge 1		Improve access to safe drinking water and sanitation
	1.1	Reduce by 50% inadequate access to safe drinking water by 2015
	1.2	Reduce by 50% inadequate access to sanitation by 2015
Challenge 2		Managing water resources efficiently and effectively
	2.1	Review of water policies and legislation
	2.2	Institute demand and supply management techniques in water supply
	2.3	Institute demand and supply management techniques in irrigation
	2.4	Undertake research and development programmes
Challenge 3		Moving towards integrated river basin management
	3.1	Establish river basin management organisations
	3.2	Develop decision support systems
	3.3	Promote equitable sharing among water users and the environment
	3.4	Mitigate water related hazards and maintain ecological balance
Challenge 4		Translating awareness to political will and capacities
	4.1	Improve governance
	4.2	Encourage multiple stakeholder participation in water resources development and management
	4.3	Mainstreaming gender concerns in the framework for action
	4.4	Develop, enhance and strengthen institutions on a decentralised and participatory manner
	4.5	Build individual capacities
Challenge 5		Moving towards adequate and affordable water services
	5.1	Enhance public-private partnerships
	5.2	Recognise that water is a natural asset and has social, cultural and economic functions and values

The Forum, comprising stakeholders from all sectors, recognises the strength of the ASEAN framework as a driver for development and respectfully recommends to representatives of ASEAN Member Countries, that action be taken to further improve and advance better practices for water management in the region.

The Forum recalled the commitments of the Millennium Declaration and the Johannesburg Plan of Implementation, including the goal to develop plans for Integrated Water Resources Management (IWRM) by 2005, and recommended the following practical actions:

1. To ensure participation of all stakeholders to:
 - Link the management of ecosystems at all scales, from the river to coastal ecosystems and from the local to the basin level.
 - Establish and apply the ecosystem approach to WRM.
 - Set-up and strengthen stakeholder forums and River Basin Organisations for dialogue, conflict resolution and collaborative management.
 - Establish flow regimes that ensure the maintenance of biodiversity and ecological and economic productivity of the basin in a sustainable and equitable manner.
 - Ensure development decisions reflect the concerns of all, with consideration to poverty and gender issues.

2. Develop legal and policy frameworks and heighten awareness of existing frameworks to promote regional collaboration, through:
 - Forging appropriate links between national and regional river basin organisations, and community organisations to improve coordination and collaborative development of knowledge and know-how.
 - Forging appropriate links between water issues such as water supply and sanitation.
 - Setting up the legal system for water-related disaster management.
3. Apply economic, social and cultural valuation and implement appropriate financial incentives to:
 - Foster proper economic, social and cultural valuation of natural and environmental resources to restore degraded and depleted resources and establish environmental fund.
 - Ensure equitable delivery of water supply and sanitation services, especially to the poor, maintain ecosystem services and the functionality of water infrastructure.
4. Build and strengthen capacity:
 - By promoting formal and informal education, raising awareness, and resource mobilisation and resource sharing about IWRM for decision-makers, professionals, communities and NGOs in necessary social and natural sciences and know-how.
 - Institutionalising mechanisms to exchange lessons learnt, local experiences, successful approaches, appropriate technologies and use of media in disseminating success stories in integrated river basin management, at all levels.

The Vientiane Action Programme (2004-2010) that was adopted by the ASEAN leaders in 2004, promotes the following measures related to freshwater resources:

- Halve by 2010 the proportion of people without sustainable access to safe drinking water (WSSD target by 2015).
- Manage water resource efficiently and effectively.
- Promote integrated river basin management.
- Promote awareness to enhance integrated water resources management.

4 Objectives

The key issue with respect to the development of the current ASEAN water resources strategic plan of action is to develop a strategy that recognises most, if not all the aforementioned “drivers” and yet at the same time delivers some real outcomes in terms of building capacity within ASEAN Member Countries. This has meant that the focus of this plan is on shorter term actions that focus on key challenges and issues, whilst recognising that some issues will be dealt with after capacity has been improved.

Given that each ASEAN Member Country has government agencies responsible for water resources management, this plan does not intend to make any recommendations specific to the governance role of these agencies. However, there are a number of principles and issues regarding integrated water resources management that are common to many, if not all, ASEAN Member Countries. Thus the overarching objective of this plan is to establish goals and strategies that will lead to outcomes of use to as many Member Countries as possible with respect to these principles and issues.

The ASEAN Strategic Plan of Action on Water Resources Management is predicated upon the fact that population and economic growth in the region will require sustainable management of available water resources. There will be an increasing demand for water from industry and domestic users, whilst at the same time food production will also need to increase. Other important factors that need to be taken into account include the potential threats imposed on water resources from climate change, current and future land and water contamination issues and the impacts of land use changes on the quantity and quality of water resources. On the socio-economic front, the above demands may both cause greater economic competition for water resources and also potential conflicts at community, national and potentially international levels. To manage potential changing environmental and social demands effectively, comprehensive strategies and action plans are needed to develop sustainable water management systems. This plan details guiding principles for integrated water

resources management, a set of strategies to deal with major issues and proposes some future project work to improve knowledge and governance procedures as well as building capacity in the region.

Specifically, given the context in which the plan has been developed, its objectives are:

- To define the governing principles that ASEAN Member Countries want recognised with respect to sustainable development of their water resources.
- To define the key challenges and issues confronting ASEAN with respect to sustainable water resources management.
- To define the key actions that will facilitate the rapid attainment of improved integrated water resources management across ASEAN.
- To define a set of project activities that will build knowledge and capacity with respect to integrated water resources management across the ASEAN region.

5 Process of Plan Development

This plan has been developed based on the following inputs:

- The design and circulation to each ASEAN Member Country of a questionnaire on the current state of water resources data, governing principles and issues.
- Independent collection and collation of water data, which together with some of the questionnaire information forms the report on the “State of Water Resources Management in ASEAN”.
- A workshop attended by ASEAN Member Countries in Bangkok on the 20-21 October 2004, during which key issues, challenges and responses were developed by the participants.

6 Governing Principles

Analysis of the responses to the questionnaire has highlighted two guiding principles that need to be espoused by ASEAN with respect to integrated water resources planning and management.

The first is the Principle of Sustainable Development – water is a finite resource, essential to sustain life, development and the environment. This principle provides context for discussing issues such as:

- Protection of water resources/ aquatic ecosystems.
- Optimal water use – water conservation and efficient use.
- Equity between generations .
- Current equitable access – fair and proper allocation for every concerned sector.
- Environmental integration (social and ecological; water and land; chemical, physical and biological).
- Water is both an economic good (it has economic value) and a public good (every citizen has the right of access to water).

Given that different individuals have different views of what defines sustainable development, the nature of the balance struck, or the emphasis put on the different sub-principles can lead to a greater or lesser focus on environmental versus social/economic issues of sustainability. However, if, for example, any one or more of the sub-principles are ignored, then we are at risk of unsustainable development.

The second key principle is the Principle of Effective Governance of Water Resources. To be effective and operable the Principle of Sustainable development needs to be enshrined in an appropriate governance framework. This framework needs attention focused on appropriate institutional structures, capacity building and means of community education and adoption, legislation and enforcement to ensure successful outcomes in water resources management. Key components for consideration under the Principle of Effective Governance include:

- Critical level of institutional capability, including people with appropriate skills and knowledge (capacity for informed action), infrastructure and financial resources.
- Institutional reform at national, provincial and basin levels.
- Participatory decision-making – water resource management or governance of river basins should be based on a participatory approach involving users, planners, policy makers, NGOs and academia at all levels.
- Decentralised responsibility – harmonise institutional roles and responsibilities across national, provincial and river basin levels.
- Legislation – principles of IWRM must be enshrined in law.
- Effective communication and awareness raising.
- Integrated land use planning.
- A commitment by the state to unify and harmonise water management across institutions and agencies.
- Political will is essential.

7 State of Water Resources Management in ASEAN

The “State of Water Resources Management in ASEAN” report was produced in conjunction with this Plan. The report highlights a number of fundamental issues that have arisen during the compilation of data and information.

Issues associated with water management will undoubtedly become of increasing importance across Southeast Asia over the next 20-50 years in the face of increasing populations and consequent competition for water resources. To some extent many Southeast Asian countries are in the fortunate position that water resources availability should not be a major limiting factor in terms of economic growth. However, they do face a number of significant challenges and issues in the years ahead. These include:

- Overall demand for water is expected to increase by about one-third over the next 20 years.
- Whilst most Southeast Asian countries do not have a physical scarcity of water, seasonal scarcity does occur. This needs to be examined in more detail and the results be used as a basis for the planning of water supply strategies for the future.
- Although there is no physical water scarcity across ASEAN (excepting Singapore), potentially rapid rates of economic development may put considerable pressure on countries in terms of financing the sustainable development of water supply and sanitation schemes.
- The need to ensure that data of the highest quality is obtained to facilitate integrated water resources management.
- As a response to seasonal water scarcity and growing urban centres, demand for groundwater will increase. Management plans need to be developed to ensure the sustainable exploitation of this critical resource and to maintain its quality.
- Given good overall water availability, most nations are in a strong position to plan how water will be managed for environmental purposes including the maintenance of key inland fisheries.
- Protection of the quality of water supplies is and will be a significant activity for all nations over the next 20 years.
- Several countries are unlikely to meet the Millennium Goals relating to drinking water and sanitation based on current rates of progress.
- In many countries it is considered that the impacts of extreme events and climate change and variability will be of as much concern to governments as many of the above issues. Subsistence farmers and the poor are generally more severely impacted by such factors and consequently they may increase poverty levels and risks of starvation unless adequately planned for.
- With respect to governance of water resources, whilst many countries are aware of the need for change to improve water resources management, there needs to be continued support at all levels to ensure that this happens.
- Fragmentation of the management of water between several agencies within countries needs to be examined to determine if improved institutional arrangements can be developed. It is particularly important that surface water and groundwater are managed by the same agency given their usual interconnectivity.

- The fragmentation referred to above also impacts negatively on the need to harmonise monitoring programmes for water quantity and quality.
- Capacity building at a range of levels is also a universal requirement with the probable exception of Singapore.

Summarising some of the above issues, it would appear that the major challenges include collection of high quality data, mitigating the impact of extreme events on water resources, sustaining and improving water quality, improving governance systems and acquiring financing for the development of new water infrastructure.

All of the above issues excepting that of financing development have been encompassed within the project portfolio that makes up part of this plan. It is a matter for the ASEAN Secretariat and the ASEAN Working Group on Water Resources Management to determine whether financing issues could be appropriately tackled by the group, or are a matter for individual jurisdictions. Finance is raised here so that it is not overlooked, given the crucial role financing will have in planning future development in ASEAN.

8 Key Issues

Analysis of the questionnaires has demonstrated two categories of issue that are important to the ASEAN Member Countries - issues specific to individual countries and more generic issues related to knowledge, institutions and capacity. This plan focuses on the latter.

Generic issues raised by several countries include:

- 1 The finite and vulnerable nature of water as a resource and the sustainability of supply and environment.
- 2 Knowledge needs on the resource and its use and accurate projections of demand vs supply
- 3 The need for participation in decision making on IWRM.
- 4 Institutional reform needs to facilitate holistic national and regional planning processes.
- 5 Economic valuation of water taking into account water as a public good but also demonstrating its real value to society.
- 6 Needs for capacity building across the entire water sector.

In the light of the above issues, the workshop that was used to assist with the development of this strategy identified four areas that would facilitate the development of focus.

These are:

- Supply, demand and allocation
- Water quality and sanitation
- Extreme events
- Governance and capacity building

The following sections detail the proposed key activities and thus strategies relating to water resources management that are priorities for ASEAN.

8.1 Supply, Demand and Allocation

Key needs:

- Improve access to safe drinking water and sanitation
- Develop IWRM country strategies by 2005
- Manage water resources efficiently and effectively
- Translate awareness of water resource issues to political will and capacity to deal with them.

Potential actions:

- 1 Develop a set of guidelines for IWRM at country level .
- 2 Exchange information and compile good practices and policies/sharing information.
- 3 Conduct forums/workshop on demand management – visit/attachments.

8.2 Water Quality and Sanitation

Key needs:

- Develop appropriate water quality indicators for countries in the region and compare with indicators used by international agencies and developed countries (eg USA, Japan).
- Develop water quality monitoring standards that take into consideration trade regulation requirements, ecological needs, environmental conservation and social and economic needs in the region.
- Provide water quality monitoring strategies for the region.
- Recognise that different countries may require the development of different approaches to attain water quality and sanitation objectives.
- Recognise that water quality and sanitation issues should be examined at the basin level within and between countries.
- Develop rules and guidelines that aid the development of safe, secure and sustainable data storage systems and facilitate sharing of data and information between agencies within countries and between countries.
- Develop appropriate reporting systems (eg river health programme – South Africa) to enable evaluation of progress with respect to water quality and sanitation objectives.

Potential Actions:

- 1 Develop appropriate water quality standards for application across ASEAN based on the harmonisation of the existing different standards and classification systems currently in use.
- 2 Develop water quality and environmental monitoring standards that take into account trade requirements and facilitate a clean-green image. These relate for example to issues such as demonstrating that agricultural production processes are sustainable and that products are free from contamination by pesticides and heavy metals.
- 3 Develop improved design of water quality monitoring options and strategies
- 4 Develop best-practice data storage and retrieval systems that facilitate modeling and prediction.
- 5 Develop improved, straightforward water quality and sanitation reporting systems
- 6 Develop data monitoring, reporting and modeling systems that can be adapted to take into account country specific needs in the region.

8.3 Climate Change and Extreme Events

Key needs:

- Conduct diagnostic studies on floods and droughts utilizing the following criteria:
 - a) uplands, urban areas, flood plains, coastal areas
 - b) classification – severity, types of impacts
 - c) mapping – geographical coverage, population, land use, risk areas
 - d) early warning and forecasting systems
 - e) monitoring, e.g telemetry (best practices/pilot projects in Malaysia, Singapore, Thailand for dam operations).
- Study the effects of climate change and El Nino/La Nina
 - a) analysis of the efficacy of existing international models for the ASEAN region (eg the Southern Oscillation Index climate model from Australia, global climate change models)
 - b) develop ASEAN and local models
 - c) analysis and prediction of potential climate change impacts on food security, public health, and infrastructure
- Develop mitigation measures

Non-structural

- 1 opportunities for alternative energy sources that can be used in ASEAN to reduce greenhouse gas emissions
- 2 reforestation/afforestation
- 3 best-practice solid waste management
- 4 integration of water and land use management
- 5 best-practice flood plain management including adaptation to floods and droughts
- 6 awareness raising/capacity building

Structural

- 1 best-practice river channel improvement
- 2 river basin development

Potential Actions:

- 1 Develop flood classification and prediction systems that denote impacts (including flood risk mapping and definition of vulnerable areas).
- 2 Analyse the impacts and risks from climate change in terms of food security, agriculture, population and infrastructure.
- 3 Develop and implement flood plain management and zoning tools that enhance national and regional planning and management processes.
- 4 Build knowledge and capacity within government agencies in order that the benefits of non-structural mitigation measures are made economically apparent.

8.4 Governance and Capacity Building

Key Needs:

Three levels of need were recognised with respect to governance and capacity building. These are shown in the figure below and include government, agencies and communities. The upper level of Government in ASEAN may be best influenced by building knowledge and understanding at the agency level and within communities.

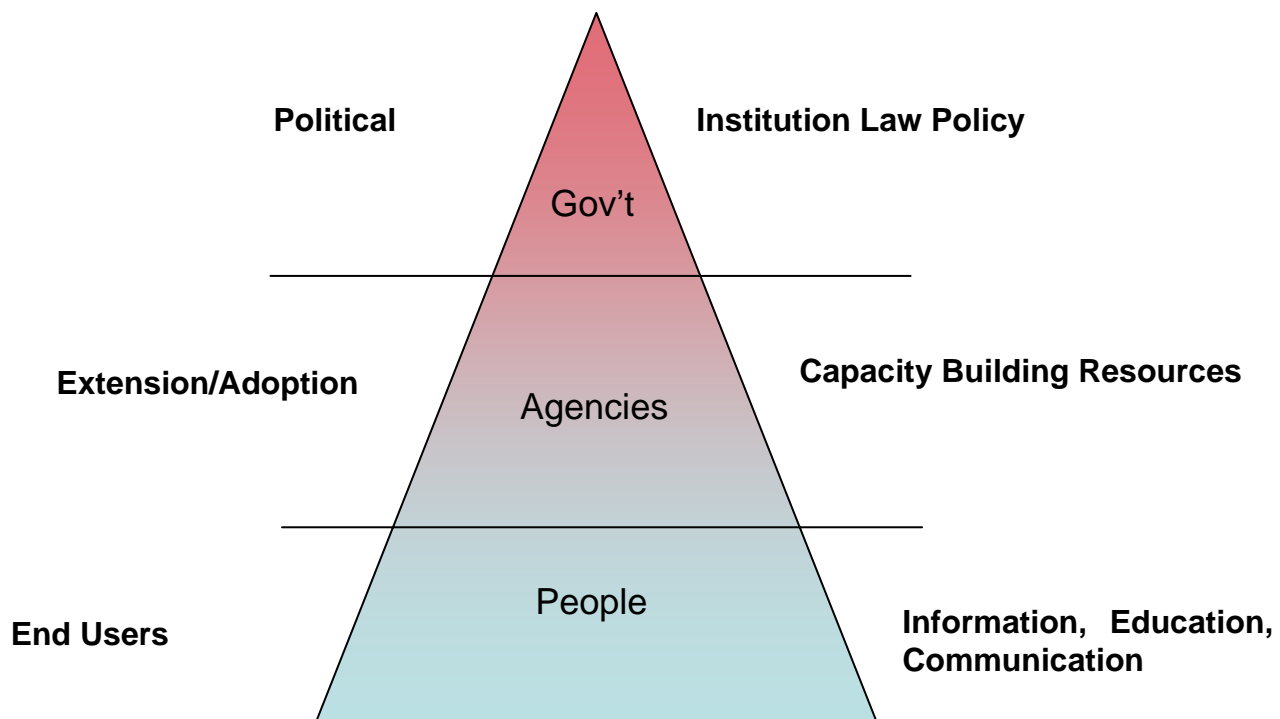


Figure 1: Governance and capacity building levels

Potential actions:

Strategies and actions to improve governance and build capacity include:

- 1 Conduct exchange programmes. Peak or apex bodies working in the water area, including international scientific organisations, NGOs and peak trade, industry and scientific associations have so much to share, but not many formal activities to exchange information on a formal and structured basis. They need to be consulted and encouraged to participate in regional and national water issues. International placements of staff between ASEAN Member Countries and with countries leading in the water management area are also important.
- 2 Provide awareness creation– study tours, invitations to launches of new schemes, strategies, products etc, media campaigns.
- 3 Ensure that the impacts of land use on catchment and river health are recognised via integrated land use planning aimed at minimising pollution in rivers.
- 4 Increase community participation in water resource management decision making including development of school curriculum material to increase awareness of IWRM.
- 5 Develop methods to increase the role of women in community level decision making related to water management.
- 6 Develop strategies to educate communities living on rivers with innovative methods to manage sanitation and pollution.

9 Project Portfolio to Underpin Strategy

Given the high number of potential action areas (19) that have been identified, it was considered by the delegates to the workshop that the development of 19 projects would be unproductive. Consequently attention was paid to developing 10 project concepts that were recognised as being of initial high priority. These are listed below against the four thematic areas described earlier in this plan. Whilst Project Concept 2 (IWRM) is listed against “Supply, demand and allocation”, its coverage is essentially broader than this one area.

9.1 Supply, Demand and Allocation

- Project Concept 1: Demand Management Learning Forums
- Project Concept 2: ASEAN IWRM Country Strategy Guidelines

9.2 Water Quality and Sanitation

- Project Concept 3: River Classification Systems
- Project Concept 4: ASEAN Water Data Management and Reporting System Design

9.3 Extreme Events

- Project Concept 5: Risks and Impacts from Extreme Events in ASEAN Member Countries

9.4 Capacity Building and Governance

- Project Concept 6: Knowledge Sharing and Exchange
- Project Concept 7: Exchanging Information and Creating Awareness in a Structured Basis between Peak Bodies
- Project Concept 8: Integrated Land Use Planning
- Project Concept 9: Increasing Long Term Awareness, Knowledge and Community Participation in Integrated Water Resource Management
- Project Concept 10: Education on Sanitation and Pollution Management

Details of these project concepts are included in Appendix 1.

9.5 Expected Outcomes and Benefits from Implementation

As indicated previously, some of the key objectives of this plan relate to improvement of integrated water resources management across ASEAN. The projects defined in Appendix 1 have as their major focus the development of understanding of the key challenges in water resources management that face ASEAN and the building of capacity within the region to deal with these challenges.

Major expected outcomes from the work proposed will include *inter alia*:

- Improved understanding and management of water demand and thus an enhanced capacity to deliver environmental flows (Project Concept 1).
- A potential consistent set of ASEAN country IWRM strategies as a basis for future water resources planning in the region (Project Concept 2).
- A uniform classification system and standards would promote standardisation and compatibility of monitoring programmes and management models across ASEAN Member Countries (Project Concept Concept 3).
- The beginning of building a long-term data base for planning and strategic management of rivers across ASEAN (Project Concept 4).
- A comprehensive diagnostic report of all the generic and country specific causal factors of floods and drought. This will provide a more in-depth understanding of hazards and risks and provide the means to formulate strategic plans for the future. Also to be included will be an analysis of the status of all the existing structural and non-structural measures by country that are potential responses to climatic change in terms of food security and agriculture (Project Concept 5).
- More rapid and efficient responses to water stress issues through adoption of best- management practices that are sensitive to ASEAN climate, governance and culture (Project Concept 6).
- Greater awareness of common ASEAN Integrated Water Resource Management issues (Project Concept 7).
- A manual of “Best Management Practice” for land use planning drawing on ASEAN and appropriate international experience (Project Concept 8).

- A manual of best ASEAN practice in maintaining awareness, knowledge and action in IWRM including specific sections for women and the education system (Project Concept 9).
- A realistic assessment as to how successful information and behavioural modification programmes can be in reducing river pollution (Project Concept 10).

It is stressed that the projects and their outcomes are designed to benefit water resources management across ASEAN as a whole by drawing on relevant local, regional and international experience and by recognising effective local best-practice and attempting to encourage its adoption across neighbouring ASEAN Member Countries.

9.6 Project Concept Implementation Process

The AWGWRM, which is the technical working body, will be responsible for the implementation of the plan. The AWGWRM will discuss and further develop the project concepts and explore potential partnerships with World Bank, Asia Development Bank and AusAID to implement the project concepts that have been identified.

It is suggested that the ASEAN Working Group on Water Resources Management are the best group to prioritise project concepts and finalise time lines for each project concept. Similarly, they are best placed to ascertain whether benefits from projects will be universal across ASEAN, or limited to specific countries and to what extent expertise already exists within some of the ASEAN for Member Countries with specific needs. To date some discussion has been held between the consultants and potential funding agencies to try and make them aware of the Plan and project portfolio. These need to be followed up by discussions between ASEAN and funding agencies such as the World Bank, Asia Development Bank and AusAID.

Appendix 1: Project Concept Proposals

Project Concept 1: Demand Management Learning Forums

1. Project Title and Brief Description

Demand Management Learning Forums

All countries have examples of localised water stress, and most are also characterised by heavy use of water in the irrigation sector. In terms of cost effectiveness, a policy of implementing demand management in the irrigation sector will release major quantities of water for re-allocation to environmental, urban and industrial uses. (In approximate terms, one hectare of paddy rice uses as much water as 80-100 households. Or looked at in another way, if irrigation uses 90 percent of all water use, then a 5 percent gain in irrigation water use efficiency frees up as much water as a 45 percent gain across every other water use sector.)

2. Project Objectives

To capitalise on the presence in the ASEAN region of examples of world's best practice in urban water demand management and to apply similar principles and practices to the irrigation sector.

3. Project Outputs

- Application of demand management to irrigation will have a major positive impact on water supply problems and assist with a move towards sustainable water resources.
- Irrigation supply infrastructure will cope better with water demands and consequently lower maintenance costs can be expected.
- The opportunity is created to establish a reserve of water for maintenance of aquatic ecosystems.

4. Activities Required to Produce these Outputs

- 1 An initial regional forum to present and learn from the acknowledged leaders in the field, together with some presentation of other international experience.
- 2 Formation of an ad hoc working group to develop an ASEAN irrigation demand strategy.
- 3 Consideration of ongoing technical forums.

5. Management and Coordination Requirements

Anticipated duration: Could be completed in 12 months

Resource requirements:

- A knowledgeable person to organise it all.
- Costs of a 2-3 day forum.
- Minor international assistance in strategy development.

Project Concept 2: ASEAN IWRM Country Strategy Guidelines

1. Project Title and Brief Description

ASEAN IWRM Country Strategy and Guidelines

Target 9 of the Millennium Development Goals requires countries to integrate the principles of sustainable development into country policies and programmes. More specifically in relation to water, the Water Supply, Sanitation and Drainage targets of the World Summit on Sustainable Development require countries to “develop integrated water resources management and water efficiency plans by 2005”.

For the most part, this latter target has only partially been realised in ASEAN Member Countries and there is some uncertainty about what IWRM actually means. Clearly an opportunity exists for ASEAN to add value by taking a regional approach.

As IWRM is a broad concept capable of many interpretations, the project aims to rapidly develop agreed regional guidelines for national IWRM strategies, and thus create confidence and certainty for ASEAN Member Countries that their national IWRM strategy will meet regional requirements and conform to international best practice.

2. Project Objectives

- 1 To guide individual country IWRM strategies by developing a generic ASEAN IWRM framework (for surface water and groundwater) that is capable of local adaptation and implementation.
- 2 To enable ASEAN to measure regional performance and progress towards IWRM goals against a regionally consistent set of strategies.

3. Project Outputs

- 1 A set of agreed regional goals for IWRM.
- 2 A set of explanatory guidelines that
 - describe the rationale for each of the regional goals
 - give guidance on development of appropriate national goals and on the policies and processes that need consideration in achieving the goals.
- 3 Simple performance monitoring tools for ASEAN to use in assessing progress in the achievement of IWRM across the region.

4. Activities Required to Produce these Outputs

Output 1: Agreed regional IWRM goals

- 1 Prepare a draft set of regional IWRM goals by a small panel of selected experts drawn from the region and internationally. The aim of the draft document is to reflect both international best practice and regional specific issues.
- 2 Facilitated discussion by the AWGWRM of the draft set of goals. This is to take place in face-to-face consultative sessions, and the Working Group will be required to negotiate a set of regional goals that can be expected to be acceptable to all ASEAN Member Countries.
- 3 Submit the negotiated set of regional IWRM goals to the ASOEN for endorsement.

Output 2: Explanatory Guidelines for ASEAN IWRM goals

- 1 Preparation of draft guidelines by the expert panel. The guidelines are required to explain the regional goals, and to discuss the development of national goals and the implications arising from implementation. These implications are to cover policy, scientific, informational, institutional and financial aspects. The guidelines are also required to draw on international experience in order to demonstrate the national processes and challenges that might be expected.
- 2 Discussion and acceptance of the guidelines by the AWGWRM. As for the IWRM goals, this will require face-to-face facilitated discussions and consultation.

Output 3: IWRM performance monitoring tools for ASEAN

- 1 Preparation of a 'report card' system of assessing current status of IWRM in each country against the status expected if ASEAN regional IWRM goals were to be achieved. Ratings on a simple 1 to 5 scale are to be developed for each goal.
- 2 Discussion and acceptance of the report card format by the AWGWRM.

5. Management and Coordination Arrangements

- 1 ASEAN Secretariat will supervise the project using a selected international consultant for all specialist inputs, document preparation and tasks. (Draft Consultant's TOR attached.)
- 2 AWGWRM oversee the process and ensure ownership of project outcomes.
- 3 Selection of an expert advisory group to provide specialist advice as needed; to facilitate the discussion and agreement process; and to prepare documents for these purposes. The expert advisory group is to consist of the international consultant, a specialist nominated by the Southeast Asia Technical Advisory Committee of the Global Water Partnership Southeast Asia, plus up to three local specialists identified by ASEAN.
- 4 Roles of the respective parties are:

ASEAN Secretariat

- Coordinate with project parties and other ASEAN bodies
- Select and contract the international consultant
- Select and convene expert panel
- Provide technical inputs and management support
- Facilitate approval of and follow-up of project outputs

International Consultant

- Prepare background paper for AWGWRM
- Draft, with assistance of expert panel, a set of regional IWRM goals
- Draft, with assistance of expert panel, guidelines on IWRM goals
- Draft, with assistance of expert panel, a report card system for monitoring progress towards regional IWRM goals
- Provide specialist assistance to consultation and discussion sessions of AWGWRM

ASEAN Working Group on Water Resources Management (AWGWRM)

- Oversee the process of development and negotiated agreement of regional IWRM goals, guidelines and monitoring arrangements
- Provide technical inputs

Global Water Partnership – Southeast Asia (GWP-SEA)

- Provide technical assistance

6. Success Measurement

Success of the project itself will be measured by existence of the project outputs and by the achievement of agreement by all ASEAN Member Countries to a set of regional IWRM goals, guidelines and monitoring arrangements.

Ultimately, success will be demonstrated by the extent to which ASEAN Member Countries find that the project outputs have positively assisted with the review and development of the corresponding national IWRM goals.

7. Risk Management

There is a risk that countries already advanced in IWRM may be reluctant to consider conforming to a regional IWRM strategy that appears to differ from their current national strategy. This should be readily overcome by negotiation and cooperative approaches.

There is a risk that some countries may in fact want the regional strategy to be prescriptive. It will be important to emphasise **outcomes** and not **methodologies** in the regional strategy document. There are many ways to achieve 'integration' and countries must be completely free to choose an approach that meets their needs and style of government.

Public participation can be a politically sensitive matter, and not all countries have similar policies or philosophies concerning the extent and manner of public participation, especially in detailed administration of water resource management. Whilst countries generally subscribe to broad principles such as those of the 1992 Dublin Principles for water resource management, the Working Group will need to be pragmatic about the specific goals for ASEAN.

Overall, it is a challenge for the developers of the regional strategy to produce an umbrella under which all countries feel comfortable, but without making the regional strategy too generalised to be really useful and meaningful. The independence of the international consultant and the GWP-SEA representative will be important in assisting the process of reaching consensus.

DRAFT TERMS OF REFERENCE FOR INTERNATIONAL CONSULTANT

Title: Water resources management consultant

Duration: Up to 40 days input spread over 12 months

Project: **ASEAN IWRM Country Strategy Guidelines**

General:

ASEAN has been working towards achieving a consistent regional approach to water resources management as part of its commitment to wise management of the region's natural resources generally. Accordingly, the recently adopted ASEAN Strategic Plan of Action on Water Resources Management (2005) provides for the preparation of regional guidelines that each Member Country can use in development of its national integrated water resources management (IWRM) strategy.

An international consultant is required to assist with the preparation of guidelines and to bring specialist independent expertise in international best practice in IWRM.

Duties and Responsibilities:

- 1 Prepare a discussion paper on IWRM as it might apply in the ASEAN region. The paper is to draw on and incorporate decisions already made by ASEAN on the broad direction and priorities for IWRM. This paper is to also draw on current international experience and best practice, including as appropriate examples particularly of implementation issues.
- 2 Together with an expert panel selected by ASEAN, prepare draft regional IWRM goals for consideration and debate by the AWGWRM.
- 3 Attend and facilitate AWGWRM meeting and take the lead as an independent specialist in directing discussion towards consensus.
- 4 Assist ASEAN in preparing a Ministerial submission for adoption of the regional IWRM goals.
- 5 Together with the expert panel, prepare, and present for discussion and acceptance, guidelines on implementation of the regional IWRM goals. The guidelines are to include background to the goals, and discussion of the policy, scientific, informational, institutional and financial aspects of adapting the goals for national implementation.
- 6 Design, and present for discussion and acceptance, a monitoring system to enable ASEAN to assess progress towards the regional IWRM goals.

Reporting:

Following establishment of the agreed ASEAN IWRM Country Strategy Guidelines, the consultant will prepare a brief exit report for the ASEAN Secretariat, including identification of possible issues that ASEAN may encounter during implementation and provide advice on managing these issues.

Supervision:

The international consultant will report to ASEAN Secretariat (details to be advised)

Qualifications:

- 1 Education. The consultant should have an appropriate university graduate education at least at the Masters Degree level in a subject relevant to the overall goals of the project (water, policy, resource management, natural resource economics, etc)
- 2 Experience and Skills: The consultant must have extensive management and policy development experience across the range of sustainable water resources management activities including water planning and development, environmental protection, allocation and water rights, urban and rural water supply and sanitation. He/she must be able to bring international experience to bear on the achievement of integrated management approaches to water matters. He/she must be skilled in facilitation of discussion groups and capable of sensitively guiding groups towards policy consensus. Knowledge and experience in ASEAN Member Countries would be highly valued.
- 3 Languages: The consultant is required to be fluent in written and spoken English.

Project Concept 3: River Classification Systems

1. Project Title and Brief Description

River Classification Systems

Develop a consolidated water resource (river) classification system(s) and associated water quality standards for ASEAN

2. Project Objectives

To provide a consistent framework within which water resources can be classified, each class representing a different level of protection and providing different potential services.

There are a number of classification systems that are either in use or have been proposed. None of these seems to carry general buy-in by all ASEAN Member Countries. The following fairly simple river classification and long-term water quality goals have been adopted by ASEAN:

Parameter	Class I: Potable Water	Class II: Recreation	Class III: Commercial Fisheries	Class IV: Irrigation
pH	6-9	6-9	5-9	5-9
BOD (mg/l)	5	5	10	10
COD (mg/l)	30	30	100	100
Amm-N (mg/l)	0.3	0.3	1	3
TSS (mg/l)	50	50	150	300
DO (mg/l)	5	5	3-5	3
Faecal Coliform (counts/ 100ml)	-	1,000	-	-

The above system is user based and do not consider the protection of the resource base *per se*. It is suggested that the classification of water resources (rivers) be extended to reflect various levels of protection and associated physical and biological parameters. Generic standards for each class should describe the conditions that need to be met for achieving any designated class.

An important aspect is to consider requirements based on trade regulations (WTO) as well as socio-economic aspirations and ecological constraints.

3. Project Outputs

- 1 A uniform classification system and standards would promote standardisation and compatibility of monitoring programmes and management models across ASEAN Member Countries.
- 2 Standards would provide a set of targets for water resource managers and provide context and guidance against which management decisions can be made about the nature and extent of permissible, sustainable resource use.
- 3 Classification of water resources would assist in achieving a balance between the long-term ecological health and integrity of all rivers and the continuing availability of water for social development and economic activities.

4. Activities Required to Produce these Outputs

- 1 Task 1 Collate information regarding existing regional approaches to classification and standards, including existing targets and ASEAN timetable, as well as the United Nations Environment Programme (UNEP Outlook 2007) framework.
- 2 Task 2 Develop a united system for the ASEAN region.
- 3 Task 3 Conduct a demonstration exercise through pilot application in a selected country or sub-region.
- 4 Task 4 Diffuse this system to all relevant operational levels within the region.

5. Management and Coordination Arrangements

Duration:

Task 1	4 months	Task 3	18 months
Task 2	4 months	Task 4	12 months (overlaps with task 3)

Resource requirements:

- Small team (approximately three people) of specialists with related experience.
- Commitment from local institutions to participate.
- Local consultants (to assist and facilitate capacity building)

Project Concept 4: ASEAN Water Data Management and Reporting System Design

1. Project Title and Brief Description

ASEAN Water Data Management and Reporting System Design

To promote and achieve the desired “clean and green” status for ASEAN Member Countries, it is necessary to have a coherent and consistent set of data relating to the condition of the region’s rivers and waterways. The project aims to create a framework for a regional system for reporting broad river health parameters that will serve both national and regional (ASEAN) needs. This requires agreement on the minimum set of reporting parameters, and cooperation in the design of the data management and reporting system. Whilst implementation will be a very large task lasting many years, early establishment of the framework is required to guide ongoing national programmes of enhancement of river monitoring and water quality assessment in ways that are consistent with regional requirements.

2. Project Objectives

To provide an expandable framework for an ASEAN regional river monitoring system that would allow ASEAN to commence assessing the status and broad trends relating to the overall condition and water quality of rivers across the region by:

- designing a limited, agreed, and affordable programme that requires national water management agencies to measure, assess and report on a regular basis.
- making full use of existing monitoring programmes (to maximise cost-effectiveness).
- maximising national consistency in monitoring related to water quality and rivers management.
- building the initial programme in a way that is capable of future expansion.

3. Project Outputs

- 1 A descriptive report and inventory of existing monitoring programmes across the region. The report is to include the reasons for existence of each programme, and is to describe how the data is stored and accessed. Depending on available funding and on the skills and knowledge of the selected consultant, the inventory ideally would be done through actual country visits and not rely upon correspondence alone.
- 2 An agreed simple, preliminary set of monitoring parameters to be recorded by each country, with the related observation data delivered to ASEAN Secretariat for purposes of assessing river health across the region.
- 3 Concurrence by each country to a set of data sharing arrangements for the agreed monitoring parameters in order to achieve the objectives of this project.
- 4 A set of protocols for data delivery (format, timing, mode etc) from national agencies to ASEAN Secretariat.
- 5 Establishment of a central database system at ASEAN Secretariat, including agreement on methods of data access, reporting and publication.

4. Activities Required to Produce these Outputs

Output 1: Report and inventory of existing river monitoring programmes

- 1 Prepare specification and contract for a consultant to prepare the inventory and monitoring programme report.
- 2 Engage suitable consultant and oversee report production. (Ideally a regionally-based consultant. Could usefully be a relevant academic/research institute.)

Output 2: Preliminary set of agreed river monitoring parameters

- 1 AWGWRM to arrange a discussion paper based on the inventory report and which canvasses possible monitoring programmes and their associated issues.
- 2 AWGWRM to facilitate/sponsor a 3-day expert workshop attended by at least a hydrologist and a water quality specialist from each country. The workshop is to agree on a minimum set of indicators. These are to be high-level rather than detailed. For example, for water quality, just 3 indicators might suffice – turbidity, total nutrients, pH.
- 3 The AWGWRM to debate and agree on the recommendations of the expert workshop. This may require several iterations, including a second workshop.

Output 3: Agreement to share data for the agreed parameters

- 1 AWGWRM to prepare draft data sharing agreement. (The 2001 Data and Information Exchange and Sharing Procedures of the Mekong River Commission, to which 4 ASEAN Member Countries are already signatories, would be an excellent model.) Note – several iterations can be expected before agreement is achieved.
- 2 Submission to Ministers for endorsement.

Output 4: Protocols for data delivery to ASEAN

- 1 AWGWRM to facilitate/sponsor a 2-day workshop for national natural resource data management professionals to develop the protocols. (Again the Mekong River Commission has recently done this for a wide range of natural resource information and would provide a suitable model.)

Output 5: Establishment of ASEAN central database and reporting system

- 1 ASEAN Secretariat to research, acquire, and install suitable time-series software.
- 2 AWGWRM to discuss and develop a reporting system for annual *State of the Rivers* reporting to ASEAN Member Countries and to the regional community.

Project Duration: 24 months

5. Management and Coordination Arrangements

- ASEAN Secretariat
 - Arrange consultant to prepare Existing Monitoring Programmes Inventory and Report
 - Oversee progress of AWGWRM and coordinate with other ASEAN bodies
 - Develop with AWGWRM an agreed project workplan to manage inputs and to measure progress and success
 - Develop and install a central water resources database
 - Provide management support
 - Facilitate approval of and follow-up of project outputs
- ASEAN Working Group on Water Resources Management (AWGWRM)
 - Responsible for the technical and policy outputs of the project
 - Sponsor/facilitate regional workshops as required
 - Provide the forum for regional negotiation and agreement on the programme
 - Provide technical inputs
- Consultant for Existing Monitoring Programmes Inventory and Report
 - Visit each country and its relevant agencies to ensure a complete inventory and a comprehensive understanding of the surrounding issues.

6. Success Measurement

Progress and performance of this project will be measured by existence of the five tangible outputs delivered according to an agreed workplan developed between the ASEAN Secretariat and the ASEAN Working Group on Water Resources Management. This workplan will need specific performance indicators to be developed for the outputs and activities.

Overall, the project will be shown to be a success when ASEAN releases the first regional report on State of the Rivers.

7. Risk Management

A risk that almost certainly will have to be managed is the probable reluctance of at least some governments to release and exchange data and information. Fortunately this issue has been experienced and overcome in the case of the four ASEAN Member Countries who are signatories to the 1995 Mekong River Agreement. The key to gaining political acceptance was the development of a procedure (signed in Nov 2001) which provides the limits and safeguards. A regional model is thus available and the countries involved will be able to share their experience with any country that might have concerns. It should also be noted that achieving an acceptable agreement can be a drawn-out process, taking, in the case of the Mekong River Commission, more than a year. However, with this model as an example, and with countries now more accustomed to scrutiny via remote sensing, there is rapidly increasing openness in these matters.

An associated risk is the publication of the collated data from the monitoring programme. Countries may be reluctant to have data published that shows that river health in some localities may be deteriorating or is below common internationally accepted standards. Management of the risk is a political process and it would be expected that the AWGWRM will show some leadership in this regard.

A common risk in such monitoring programmes is that water quality scientists will tend to favour highly-detailed and complex monitoring to meet their purposes. The AWGWRM will need to ensure from the outset that the purpose of the regional monitoring programme is to foster improved water policy, not to conduct scientific research. For this reason, it is necessary to limit water quality indicators, in particular, to a very few (3 to 4) broad generic indicators. Water quality monitoring is a very expensive process and will be difficult financially for those countries already struggling to finance their water quantity (hydrometric) network. Pragmatism must rule.

To manage all three broad categories of risk listed above, it will be important for ASEAN to start with a small and affordable monitoring network that is capable of growing as needs and funding dictate. Many such initiatives around the world have failed because of the design being over-ambitious at the outset.

Project Concept 5: Risks and Impacts from Extreme Events in ASEAN Member Countries

1. Project Title and Brief Description

Risks and Impacts from Extreme Events in ASEAN Member Countries

Full Project Title Determination of the causes, severity and impacts of potential flood and drought hazards on food production and infrastructure and examination of potential appropriate ameliorative measures in ASEAN Member Countries

All ASEAN Member Countries have experienced floods and drought conditions of varying intensity at one time or another. Floods and drought frequency appears to be increasing and there are heightened expectations from the public for the authorities to address these two problems, given that large populations live and make their livelihoods in low lying areas.

While floods can be predicted to a certain extent such that there can be protection accorded to lives and property before they occur, droughts are insidious, and often their onset is little more than a dry spell which is not taken seriously until the effects are serious. In either case, the impacts on lives, property and the environment can be devastating.

Consequently, all the countries in ASEAN expressed during the Bangkok ASEAN Strategic Plan of Action on Water Resources Management Project Workshop (October 2004), a need for knowledge and capacity building that enables them to develop strategic measures to deal with the devastating effects of floods and droughts and other related events. With respect to floods, Thailand has shown very clearly that the country experiences two main types of floods, flash floods which are very devastating and more gradual floods that are more controllable. Myanmar, Cambodia and Viet Nam have concerns regarding low lying coastal areas prone to inundation.

Most of the causal factors are known but some are still not fully understood. These include climatic changes and the occurrence of El Nino and La Nina that seem to come in regular intervals causing widespread damage such as floods, droughts and their consequent effects such as forest fires, higher incidence of water related and respiratory diseases. In some areas land use changes resulting from shifting cultivation and forest clearing are markedly changing run-off patterns and increasing flood and landslide hazards.

Currently, all ASEAN Member Countries have indicated that there are significant data and information gaps with respect to risks and impacts of floods and droughts. They note that there is a need to create understanding of the conditions when floods and drought occur; capacity building to recognise and diagnose the onset of such events; find solutions and mitigation measures to abate the events; and most important of all to share information, knowledge and solutions to the problems although each country within ASEAN would have their own specific problems and would therefore require country specific solutions.

ASEAN Member Countries have also indicated that they would like this study to take into account the impacts of future climate change and variability on floods and drought. Potential inputs to this component of the study would be an assessment of the predictions available from existing climate change models, their spatial resolution and ability to provide sub-regional to local information. Remote sensing and geographic information systems will be used to determine land cover changes. These will be tied in to existing in-country systems (where these exist).

Whilst the first part of this study would focus on assessment of risks and impacts, the second part would examine ways in which these impacts could be mitigated using a range of existing methods ranging from structural to non-structural solutions.

Currently, all countries use structural measures and, as indicated by Myanmar, they have provisions for drainage channels to drain the floodwaters efficiently. Other countries such as Viet Nam, Thailand, Philippines and Malaysia have levees and bunds to keep out the floodwaters especially in coastal areas where the floods are exacerbated by storm surges. Singapore has a very efficient and well maintained drainage system to keep out the floods. Basically, every country has structural measures most appropriate to respond to their conditions. They also have institutions and agencies responsible for these measures.

With respect to non-structural measures, all the Member Countries expressed that this field is fertile for development and that there is a lack of current understanding and knowledge about which measures work where. For example, the extent to which revegetation following forest clearing in Cambodia will reduce flood incidence is unknown. An interest was also expressed in this issue by Viet Nam and Malaysia, although it has been indicated by them that reforestation has been carried out extensively. Similarly whether revegetation can mitigate the impacts of severe floods is also unknown in these countries.

2. Project Objectives

To determine causes, impacts and mitigation measures for floods and droughts in order to ensure food security, reduce loss of lives and property and limit damage to the environment.
The project will also review methods to mitigate the impacts of land use change, floods and drought.

3. Project Outputs

- 1 An initial assessment of main climatic trends that ASEAN Member Countries are likely to experience over the next 50-100 years
- 2 An analysis of the potential impacts of these changes on flooding, drought, food production, people, economies and infrastructure
- 3 Remote sensing and GIS methodologies for use by ASEAN Member Countries to detect and monitor land use changes that may affect flood and drought hazards.
- 4 Recommendations regarding the suitability of different types of mitigative measures for different situations and environments
- 5 A workshop to build capacity within ASEAN Member Countries to adopt methodologies and use the information generated for planning purposes

The beneficiaries will be the Government, policy makers, government agencies and their planners and implementers (for contingency planning such as secure food security, evacuation and relocations of affected communities, affected locations of infrastructure), civil society that includes all children and communities – so that they will be more aware and ready prepared when such events occur. Communities will be more prepared and involve in risk management.

4. Activities Required to Produce these Outputs

1. Project inception meeting to clarify what each country can deliver to the study in terms of existing data, technical support (e.g GIS and remote sensing capability) and define the appropriate technical requirements for project outputs such as maps and GIS information
2. a) Comparative study of existing climate model predictions for ASEAN Member Countries
b) Development of remote sensing and GIS analytical methods to detect land use changes relevant to flooding at scales appropriate to hydrological prediction
c) Selection of appropriate land use change- hydrological response models suitable for application to flood and drought applications for ASEAN Member Countries
3. Analysis of impacts of potential land use changes on food production, people, infrastructure and the economy for a selected test areas in each country
4. Recommendations for mitigation of potential impacts in each test area.
5. Final workshop and reporting

Anticipated Duration

Activity 1	3 Months (through workshop and feedback)
Activity 2	18 months
Activity 3	12 months
Activity 4	4 months
Activity 5	3 months

5. Management and Coordination Arrangements

ASEAN Secretariat

- Project leadership with consultants

ASEAN Member Country inputs

- All countries will participate in terms of providing information on baseline GIS and remote sensing capabilities, digital terrain information (e.g DTMs if available)
- Resource personnel from each country to collect the data and information for test areas
- Provisions of study tours and site demonstrations to demonstrate how some countries are providing the diagnostic tools and ameliorative responses to some of these problems.

The types of country inputs expected will be examples of where they have developed best-practice with respect to both structural and non-structural measures to mitigate against disasters and climate change. These include:

Non-structural measures

- reduce greenhouse gases through alternative energy sources (Philippines, Thailand)
- reforestation/afforestation (Malaysia, Philippines, Thailand, Cambodia, Viet Nam, Lao PDR)
- proper solid waste management (Philippines)
- integration of water and use land management (Malaysia, Thailand, Viet Nam)
- proper flood plain management including adaptation to floods and droughts (Thailand, Cambodia, Viet Nam)
- awareness raising/capacity building (Viet Nam, Thailand, Malaysia)

Structural Measures

- proper river channel improvement (Myanmar, Viet Nam, Thailand)

Similarly, the Philippines has experience in Geographical Information Mapping (GIS) of low lying areas and has indicated that it will provide the services for such tasks if required. Underlying the non-structural measures is the need for accurate warning systems for any impending disaster to ensure there is time for evacuation by those staying in high risk areas. While early rainfall warning systems have been installed in some countries such as Malaysia and Singapore, most countries are in need of a flood warning systems such as telemetry. The various countries have also expressed the need for best practices and pilot projects to be shared by countries including:

- monitoring through telemetry systems for dam operations and extreme floods downstream (Malaysia, Singapore and Thailand to provide the capacity building for other countries)
- monitoring climate change and El Nino/La Nina impacts
- application of existing world and regional models (e.g SOI model from Australia) of climate change to Southeast Asia
- forecasting the effects of extreme events and climate change on food security, public health, infrastructure (all countries)
- demonstration of effectiveness of mitigation measures in ASEAN

Project Consultants

- Project leadership with ASEAN Secretariat
- Analysis of outputs of existing relevant global climate models to determine impacts on Southeast Asia
- Analysis of impacts of extreme events and climate change scenarios on population, food security and infrastructure in selected test areas
- Training and capacity building to later implement the tools developed
- Organisation of workshop
- Project reporting

Project Concept 6: Knowledge Sharing and Exchange

1. Project Title and Brief Description

Knowledge Sharing and Exchange

Full Project Title Information sharing and exchange on good policies and practices

In accord with the relative stress on each country's water resources, ASEAN Member Countries are at various stages of policy development and practice on the matter of water supply, demand and allocation management. Countries with lesser water stress can benefit from studying and learning from those at the forefront which are solving the problems of limited water resources in a Southeast Asian context. Technical information is presently more readily available than strategy and policy development information and there is a need to continue to develop ASEAN capacity in the skills of strategic planning and meaningful policy development in the field of water resource management.

1. Project Objectives

Creation of an established ASEAN means of sharing experiences, initially in the field of water supply, demand and allocation management, and development of an accessible ASEAN resource document centre on good practices and policies.

3. Project Outputs

- Countries starting to experience water stress, either locally or nationally, will be able to respond more rapidly and efficiently to this challenge by avoiding less successful practices and by adopting their own suitable variation of proven successful practices that are sensitive to ASEAN climate, governance and culture.
- ASEAN will benefit through more efficient and sustainable use of regional water resources and by the increased regional cooperation that will result from the coming together of national officials to meet mutual goals.

4. Activities Required to Produce these Outputs

- 1 Each country to nominate a field in which it believes its policies and practices are presently in the top quartile of ASEAN water management success stories, and to compile a resource document in accord with a format to be developed by the ASEAN Secretariat and designed to demonstrate principles and lessons learned (ongoing).
- 2 ASEAN to create a water resource management page on its website to store these documents for easy authorised access (ongoing).
- 3 Senior officials (Director level and above) to meet in a regular forum to share these experiences in a cooperative manner and in particular to share information on the cultural, social and political issues that must be addressed in order to not only develop good policy, but to bring it into successful practice (2-yearly).
- 4 An initial forum to explore the utility of running specific learning forums and seminars on the skills and practices of public policy formulation (existing packaged courses are available).

5. Management and Coordination Arrangements

Anticipated duration: Ongoing, but focussed around the creation of a forum of senior water officials that will meet regularly, but continue to share and exchange views on a continuous basis by all available means.

Resource requirements:

- Brief need for website specialist to set up searchable document database, with search functions specific to water management policy and practice.
- Travel, accommodation and venue costs for bi-annual senior water officials' forum.

Project Concept 7: Exchanging Information and Creating Awareness in a Structured Basis between Peak Bodies

1. Project Title and Brief Description

Exchanging Information and Creating Awareness in a Structured Basis between Peak Bodies

To create and maintain a forum for water resource and environmental government agencies and NGOs and peak industry bodies and associations with an interest in water management issues throughout ASEAN to create awareness of key water resource management problems and to exchange information about generic solutions.

2. Project Objectives

- 1 To create awareness of key water resource management problems and to exchange information about generic solutions with NGOs and peak industry bodies and associations with an interest in water management issues throughout ASEAN.

3. Project Outputs

Outputs will include

- 1 Greater awareness and subsequently implementation of common ASEAN Integrated Water Resource Management issues.
- 2 A pooled information resource through records of methodological evaluation, data analysis, and interpretation of data.
- 3 An improved and sustained interpersonal network between ASEAN water managers.
- 4 Programmes on key water resource issues (eg Water quality) which have a common generic approach.
- 5 Raised public awareness and knowledge through publication of the proceedings at various levels - political, executive agency, industry and the general public.

4. Activities Required to Produce these Outputs

- 1 Identify key government agencies, NGOs and industry bodies with an interest in water management issues (the consultant in conjunction with ASEAN Secretariat).
- 2 The consultant, with ASEAN participants, to conduct an initial workshop to define core water resource issues that would benefit from such a programme, ie the issues where sharing would be advantageous (some of these have been identified in the 'State of Water Resources Management in ASEAN' report).
- 3 Develop a communications plan associated with the outcomes of each forum (the consultant and ASEAN partners). The consultant will provide an initial draft for review by ASEAN partners.
- 4 Conduct a programme of three forums per year covering the most significant water resource issues in the ASEAN region. An initial list can be drawn up from the Strategic Plan of Action.
- 5 Publish proceedings from each of the meetings that will include and action plan on each issue from a regional perspective. A host nation will be identified for the implementation of each issue. This will be achieved in the implementation of activity. It is envisaged that this task could be undertaken by an appropriate tertiary education institution.
- 6 Evaluate the development of networks and knowledge dissemination will be conducted by the consultant in association with the participating agencies.

Apart from the first activity which is the establishment phase each of the five activities provide input to the five outputs.

Project Duration: 12 months

5. Management and Coordination Arrangements

- 1 ASEAN Secretariat will supervise the project using a selected international consultant for all specialist inputs, document preparation and tasks.
- 2 A consultant would be used to lead the project, run the workshop and develop the communication plan.
- 3 Roles of the respective parties are:

ASEAN Secretariat

- Coordinate with Project parties and other ASEAN bodies
- Select and contract the international consultant
- Facilitate approval of and follow-up of project outputs

International Consultant

- Develop workshop programme
- Facilitate workshop and workshop reporting
- Write the communication plan
- Identify appropriate tertiary institutes to contribute to information exchange processes
- Evaluate networks and knowledge dissemination processes arising from the project

ASEAN Working Group on Water Resources Management (AWGWRM)

- Oversee the process of development, workshop content and advise on topics for fora
- Attend initial workshop

Global Water Partnership – Southeast Asia (GWP-SEA)

- Provide technical assistance and linkages to potential project partners.

6. Success Measurement

The development of information and implementation networks will be monitored after the completion of the project. The existence of new and relevant publications for the key water resource management issues in the region will provide concrete output.

7. Risk Management

This is a low risk project with the greatest problems relating to the willingness of the ASEAN Member Countries to participate and organisational issues relating to the ability of the project team to get key individuals for particular issues together at the same time.

Project Concept 8: Integrated Land Use Planning

1. Project Title and Brief Description

Integrated Land Use Planning

Full Project Title Integrated land use planning aimed at minimising pollution in rivers

There are significant problems with integrating land resource planning with ongoing management of rivers. These problems are manifested in inappropriate land use allocation and practices in some rural circumstances (eg in the clearing of steep land for agriculture resulting in erosion of hillsides and the sedimentation of rivers) and also in city development (eg in the inappropriate flow of urban drainage to the river and its resultant pollution). While such problems are well known the solutions are often more difficult to prescribe. Social, cultural, behavioural and institutional factors can intervene to place conflicting demands in front of planners. Even when there are well constructed River Basin projects with well defined public input the coordination between local, regional and national perspectives can be difficult. Those upstream can, on occasions be perceived as lacking an adequate understanding about the effects of land allocation and use on river based issues downstream. Statutory planners often frame planning questions and responses differently from natural resource managers.

Nevertheless, there has been progress in improving the functioning of institutions in this context, particularly in regard to the decentralisation of planning and management in a number of ASEAN Member Countries and there has been a growing attention to the issue of integration internationally. Much could be learned from identifying and applying best management practices for the ASEAN region. This is best done through analysing a range of case studies differing in their approach and development.

2. Project Objectives

Through selected case studies in four selected nations to develop a model for best practice in integrating land use planning with pollution prevention in rivers.

3. Project Outputs

- A review of current attempts to integrate land use and river planning.
- Identification of priority areas for improvement in integration.
- A manual of "Best Management Practice" drawing on ASEAN and appropriate international experience.

4. Activities Required to Produce these Outputs

- 1 Conduct a workshop (including some non ASEAN participants to select four case studies.
- 2 Assemble an ASEAN implementation team with access to selected consultants.
- 3 Select and refinement of an evaluation model for integrated catchment management (there are several international ones available for adaptation as necessary—eg Australian report card model).
- 4 Apply the evaluation model.
- 5 Prepare a Best Management Practice Manual for ASEAN including communications plan.
- 6 Disseminate the Manual as per the Communication Plan.

Publications: Best management practice manual for integration of land use and river planning.

5. Management and Coordination Requirements

Anticipated duration: The duration will be approximately 2 years six months. Six months are required for planning and two years for the conduct of the evaluation.

Resource requirements: Support for ASEAN implementation team. An evaluation consultant team preferably including international and ASEAN based personnel. International guests for initial workshop.

Project Concept 9: Increasing Long Term Awareness, Knowledge and Community Participation in Integrated Water Resource Management

1. Project Title and Brief Description

Increasing Long Term Awareness, Knowledge and Community Participation in Integrated Water Resource Management

The project will provide for greater cohesion and exchange of information and best practice between key ASEAN organisations

It is recognised worldwide that for IWRM to succeed it requires the ownership, involvement and commitment of local and regional communities. The achievement of this has a number of components. Firstly the public need to be aware of the issues underlying the need for IWRM and sufficient knowledge to participate in IWRM. In turn the agencies involved in implementing IWRM need access to local and regional knowledge to make their programmes both achievable and effective. This involves creating an understanding of what is currently known by the local community, how they are already involved, behavioural change issues that may be relevant to implementing IWRM (for both the community and agencies), impediments to involvement and so on. Secondly there is a need to interpret this information in relation to particular sectors of the community that will be influential in maintaining motivation and involvement in the long term. Two obvious and high priority groups for achieving long term impacts are women and students at all levels of the education system. Therefore these two sectors of the community have been included in the objectives for specific attention. The specific analysis of the two sectors within the overall project and the evaluation of the potential for formal education systems encouraging long term involvement would be a world first.

2. Project Objectives

The objectives of this programme are

- 1 to increase awareness and voluntary community activity for Integrated Water Resources Management through an educational and behavioural change programme targeted particularly at women and students.
- 2 to monitor the effectiveness of this programme to maximise its effectiveness and general applicability.

3. Project Outputs

- 1 A baseline measurement that establishes the degree of awareness, knowledge, involvement, potential involvement if impediments identified, the nature of the impediments, positive motivations for involvement, current IWRM related behaviour for four contrasting case studies in the ASEAN region.
- 2 An analysis of this baseline for the community as a whole but also on a sectoral basis, particularly women and children.
- 3 Implementation of a "critical path" plan (including formal education programmes) to improve awareness and involvement in key IWRM issues in four selected case studies.
- 4 An evaluation report of the success of this programme.
- 5 A manual of best ASEAN practice in maintaining awareness, knowledge and action in IWRM including specific sections for women and the education system.

4. Activities Required to Produce these Outputs

Output 1:

Selection of case studies-by ASEAN Secretariat, AWGWRM and consultant

Formation of Study Implementation team based on case studies and with the inclusion of some pertinent international contributors. It is envisaged that the study team will include participants from local tertiary institutions.

Design of baseline social research (possibly using interview or survey techniques but methods will be chosen to be reflective of the local culture and environment).

Output 2:

Conduct, analysis of social research including sectoral analysis (consultant and local researchers)

Evaluation of outcomes of the programme will be conducted by the study team.

Output 3:

Report of baseline report including recommendations for critical path programme.

Output 4:

Educational materials will be developed by local tertiary institutions and conduct of meetings and other awareness raising activities will as far as possible be undertaken by the local communities and groups in each of the case study areas.

Output 5:

Preparation of best practice manual including sections for women and educational institutions. This will also be led by the study team although local input will be important.

Project Duration: 36 months

5. Management and Coordination Arrangements

ASEAN Secretariat will supervise the project using a selected international consultant for all specialist inputs, document preparation and tasks.

ASEAN will arrange formation of an AWGWRM steering committee to oversee the process and ensure ownership of project outcomes. (The Steering Committee for this project could be built up from the one to be developed for the IWRN Guidelines Project proposed in this document).

Roles of the respective parties are:

ASEAN Secretariat

Coordinate with Project parties and other ASEAN bodies

Select and contract the international consultant

Provide technical inputs and management support

Facilitate approval of and follow-up of project outputs

International Consultant

Design survey and data gathering procedures in consultation with key regional institutions

Facilitate and supervise collection of survey data with local institutions

Analyse and report on data collected

Develop critical path plan

Produce best-practice manual

ASEAN Working Group on Water Resources Management (AWGWRM)

Oversee the process of development and negotiated agreement of regional IWRM goals, guidelines and monitoring arrangements

Provide technical input

Evaluate success of project components

Global Water Partnership – Southeast Asia (GWP-SEA)

Provide technical assistance and linkages to key institutions

6. Success Measurement

This is an integral part of the project design and will include interviews, group techniques and where appropriate formal surveys. Analysis could also be based on public or media records on the content of local water debates.

7. Risk Management

This is a low risk project with the greatest problems relating to the willingness of the local community, tertiary institutions and government departments to participate, and organisational issues relating to the ability of the project team to get key individuals for particular issues together at the same time. Risk will be minimised by the conduct of the initial baseline measures leading to a good understanding of the local community.

Project Concept 10: Education on Sanitation and Pollution Management

1. Project Title and Brief Description

Education on Sanitation and Pollution Management

Full Project Title Strategies to educate communities living on rivers and methods to manage sanitation and pollution

Many ASEAN communities are river based. Some of these communities are villages, others part of major cities. All have the potential to severely degrade river health through inappropriate design of sanitation or damaging behaviours such as the use of the river for garbage disposal. Land use impacts for example caused by the inappropriate use of fertilisers can also be damaging. These problems can theoretically be “solved” through the use of legally based means such as regulations. The problem is these regulations are difficult to enforce and if not supported by the community will be ineffective. In this case it is important that we establish the extent to which education and behavioural change programmes can influence behaviours negatively affecting the river. This project suggests a community development and behavioural change project to establish how effective community education and behavioural modification programmes can be in promoting long term stewardship of rivers. This project will assess this potential in an urban and rural setting.

2. Project Objectives

Improve river health impacts of sanitation and other river based activities through community based education and behavioural change.

3. Project Outputs

- A realistic assessment as to how successful information and behavioural modification programmes can be in reducing river pollution.
- Provide a series of recommendations as to how to maximise the success of such programmes.
- Provide an evaluation model including both social and biophysical indicators for measuring success.

4. Activities Required to Produce these Outputs

- 1 Formulate a generic information- behavioural change model (a model that looks at how and why people respond to certain information and situations and how they can be persuaded to change their views) based on preliminary investigations and collaboration with two local communities.
- 2 Pre-test the model and confirm with local communities.
- 3 Develop an education and behaviour change programme based on the agreed model.
- 4 Apply the model through intensive application at two preferred sites.
- 5 Evaluate the model’s effectiveness.
- 6 Revise the model from community feedback.
- 7 Develop specific recommendations for future programmes including water quality indices for future applications.

Publications

One large document will be produced describing the process, model and evaluation data. To assist programme managers, a separate smaller document will also be published, outlining the final model and how to implement it for specific programmes. Finally the education materials required to implement the critical path model will be published to be widely available.

5. Management and Coordination Requirements

Anticipated duration: Total two years. Three months consultation with the community, three months finalisation of model; twelve months conduct of the programme at both sites, three months evaluation of programme, three months revision of model and development of recommendations.

Resource requirements: Project team to be assembled to include agency members, local social researchers perhaps supplemented by an international researcher each in community psychology and educational evaluation. Financial resources for conduct of research and preparation of materials will be required.



Ten Nations One Community

ASEANWEB
www.aseansec.org