



ROADMAP ON ASEAN COOPERATION TOWARDS TRANSBOUNDARY HAZE POLLUTION CONTROL WITH MEANS OF IMPLEMENTATION

1. Background

The ASEAN region has experienced episodes of transboundary haze pollution arising from land and forest fires over the past two decades. Given the significant social, economic and environmental impacts of transboundary haze pollution. Haze-related impacts may not directly cause severe damages as those caused by the flames but the impacts can bring widespread direct and indirect damages covering several dimensions including ecological, health, economic and social. Significant damages are briefly presented below.

Ecological damages: Haze-related impacts contribute to the production of ozone, acid rain, and greenhouse gases.

Crop productivity damages: Haze obstructs some solar radiation causing a reduction of photosynthesis in plants leading to a decreased productivity.

Health damages: Short-term illnesses caused by haze include eye irritation, skin ailments, asthma, allergies, difficulty in breathing, acute respiratory symptoms, decreased lung function, cardiovascular diseases, and contribution to the premature death. The impacts of haze can possibly cause long-term human health effects however long term research is required.

Transportation damages: Very deteriorated visibility by severe haze pollution causes transportation damages and losses which include commercial airliner crash, closures of airports, cancellations of flights, disruption of river transport and marine traffic and interruption of cargo shipping.

Social damages: Severe haze problem forces school closures for a period of time and compels to reduce work-force and productivity.

Other damages: Other losses by severe haze pollution include serious declines in tourism business and slower growth in trade and investment.

Impacts of haze pollution are diverse and sometimes indirect and non-tangible. This leads to the difficulty in verifying the damages in quantitative term and quantifying the losses in monetary term. Massive amount of data input and reliable model/method are required for the estimation. Documents on verification and estimation of the impacts are therefore very limited and the estimation results are very varied due to different parameters and methods applied.

ASEAN Member States (AMS) have launched several regional initiatives to promote regional collaboration (please see **ANNEX 1** for the progress of initiatives and achievements made so far). One of the most significant endeavours was the development of the ASEAN Agreement on Transboundary Haze Pollution (AATHP), which was signed by all AMS in June 2002 and came into force in 2013, following the ratification of 6 AMS. By January 2015,

all AMS had ratified the Agreement. The ratification of the Agreement by all AMS gave a new impetus for the implementation of the AATHP. To further operationalise the implementation of AATHP, the 11th Meeting of the Conference of the Parties to the AATHP held in October 2015 in Hanoi, Viet Nam agreed to develop a Roadmap on ASEAN Cooperation towards Transboundary Haze Pollution Control with Means of Implementation.

2. Roadmap on ASEAN Cooperation towards Transboundary Haze Pollution Control

The Roadmap on ASEAN Cooperation towards Transboundary Haze Pollution Control was developed by a Task Force consisting of senior officials and experts from AMS who are responsible for the fire management and transboundary haze pollution issues in the respective countries, as well as invited experts and partners. A three day-workshop was held on 7-9 March 2016 in Chiangmai, and Thailand to develop the first draft of the Roadmap.

The Roadmap serves as a strategic framework for the implementation of collaborative actions to control transboundary haze pollution in the ASEAN region. It consists of four (4) main components, i.e. the vision, the overall goal with indicators, key strategies with measures of progress, and actions. The Roadmap also indicates specific timeframe for the implementation of the proposed actions.

3. Vision

The Vision for the Roadmap on ASEAN Cooperation towards Transboundary Haze Pollution Control is as follows:

“Transboundary Haze-Free ASEAN by 2020”

“Transboundary Haze” means *“Regional transboundary haze pollution from forest and/or land fires”* while “Transboundary Haze Free” is defined as *“Measurable improvement of the situation of regional transboundary haze pollution from forest and/or land fires through quantitative indicators and targets”*.

4. Overall Goal

To attain the above-mentioned vision of Transboundary Haze-Free ASEAN by 2020, the overall goal of the Roadmap is as follows:

“Regional transboundary haze pollution is eliminated through intensifying collective actions to prevent and control forest and/or land fires”

It builds on the principle of the ASEAN Socio-Cultural Community (ASCC) Blueprint 2025 vision that aims for a sustainable community that promotes social development and environmental protection, among others.

5. Indicators

- An increase of numbers of days having good or moderate air quality in terms of Pollutant Standard Index (PSI) or Air Quality Index (AQI) based on PM10 and/or PM2.5
- Reduction of hotspot numbers below alert level 2 under the ASEAN SOP on haze
- Decrease of transboundary haze pollution area.

6. Key Strategies, Measures of Progress and Actions

The following are key strategic components that translate the principles of the AATHP into concrete and collective actions under the Roadmap:

- i. Implementation of the ASEAN Agreement on Transboundary Haze Pollution (AATHP);
- ii. Sustainable Management of Peatlands for Peatland Fires Prevention;
- iii. Sustainable Management of Agricultural Land and Forest for Large Scale Forest and/or Land Fires Prevention;
- iv. Strengthening Policies, Laws, Regulations and their Implementations, including to facilitate exchange of experience and relevant information among enforcement authorities of the Parties in accordance with the AATHP Article 16 (f);
- v. Enhancing Cooperation, Exchange of Information and Technology, and Strengthening of Capacity of Institutions at All Levels;
- vi. Enhancing Public Awareness and Cross-Sectoral and Stakeholders Participation;
- vii. Securing Adequate Resources from Multi-Stakeholders for Transboundary Haze Prevention; and
- viii. Reducing Health and Environmental Risks and Protection of Global Environment.

Issues to be addressed through each strategy are specific. The strategies vary from effective implementation of the AATHP as a whole, cross-sectoral and institutional strengthening, to promoting good practices particularly on fire prevention, preparedness and response, haze pollution control, and addressing the impacts. However, they are to some extent inter-related and mutually reinforcing. To effectively deliver the strategies, there is a set of actions to be implemented at different levels and timescales, subject to capacity and capability of the respective member states.

Strategy 1: Implementation of the ASEAN Agreement on Transboundary Haze Pollution (AATHP)

The ASEAN Coordinating Centre for Transboundary Haze Pollution Control (ACC THPC) established under the AATHP needs to be physically established and fully operationalised to be able to assist AMS in effectively implementing the AATHP. Therefore, among key actions to be implemented under this Roadmap include the timely establishment and operationalisation of the ACC and enhancement of monitoring and prevention capabilities. The ASEAN Transboundary Haze Pollution Control Fund (Haze Fund) also needs to be expanded to include increased contributions from AMS and external sources, in order to be utilised for various activities as set out in the Financial Rules of the Haze Fund.

Measures of Progress

- Establishment of ACC in 2016 and its full operation within 2018
- Institutionalisation of early international haze assistance
- Establishment and full operation of all National Monitoring and Warning Systems, coordinated by ACC
- Effective implementation of preventive measures

Actions and Logical Frameworks

1. Establish ACC
 - a. Conduct a workshop on the establishment of ACC
 - b. COP to adopt and sign the Agreement on the Establishment of ACC
 - c. Develop the Host Country Agreement
 - d. Recruit the ACC staff members
 - e. Fully operationalise the ACC (e.g. SOP in place, equipment and facilities installed)
2. Fully implement and enhance the Standard Operating Procedure (SOP) for Monitoring, Assessment and Joint Emergency Response
 - a. Fully implement the SOP for Monitoring, Assessment and Joint Emergency Response (which includes Alert Levels and Trigger Points on Fire Suppression)
 - b. Enhance the SOP for enabling early response
3. Enhance Appropriate Measures in Monitoring, Assessment and Early Warning Systems to Prevent Transboundary Haze Pollution arising from Land and /or Forest Fires
4. Review and revise the Fire Fighting Inventory Database
5. Fully mobilise the Panel of ASEAN Experts on Fire and Haze Assessment and Coordination to assess the fire situation on the ground and further recommend the external fire assistance
6. Enhance contributions to the ASEAN Haze Fund
 - a. Explore increased contributions by AMS
 - b. Seek external contributions
7. Enhance Work Programme under AATHP
 - a. Effectively implement Work Programme
 - b. Ensure regular reporting of the Work Programme at the COP

Action	Responsible Parties	Time Period	Target Areas	Resources	Measure of Progress
Strategy 1: Implementation of the AATHP, i.e. establishment of the ASEAN Coordinating Centre for Transboundary Haze Pollution Control (ACC), provisions on monitoring and prevention preparedness and early response etc.					
1. Establishment of ACC					<ul style="list-style-type: none"> • ACC established • Institutionalising early international haze assistance • Monitoring and warning systems established and in full operation by all Member States and coordinated by ACC • Preventive measures implemented
1.1 Conduct a workshop for the preparation of the establishment of ACC	Indonesia	April 2016	Indonesia	Indonesia (local organising host) and AMS (participation cost)	
1.2 [Signing/adoption] by the COP on the Agreement on the Establishment of ACC	COM	August 2016	Malaysia	Malaysia (local organising cost) and AMS (participation cost)	
1.3 Development of the Host Country Agreement	Indonesia	2017-2018	Indonesia	AMS	
1.4 Recruitment of the ACC staff	TBC	2017-2018	Indonesia	AMS	
1.5 Full operationalisation of the ACC such as the SOP in place, equipment and facilities installed, staff members recruitment	Executive Director of ACC	2018	Indonesia	AMS	
2. Fully implement the SOP for Monitoring, Assessment and Joint Emergency Response, which includes Alert Levels and Trigger Points on Fire Suppression and further enhance the SOP to enable early response	AMS facilitated by ACC	2018	AMS	AMS	

Action	Responsible Parties	Time Period	Target Areas	Resources	Measure of Progress
3. Fully mobilise the Panel of ASEAN Experts on Fire and Haze Assessment and Coordination to assess the fire situation on the ground and further recommend the external fire assistance	AMS facilitated by ACC	2018	AMS	AMS	
4. Review and revise the Fire Fighting Inventory Database	AMS facilitated by ACC	2018	AMS	AMS	
5. Seek external contributions to the ASEAN Haze Fund	COM, COP, ACC and ASEC	2016	AMS	AMS	
6. Explore increased AMS contributions to the ASEAN Haze Fund	COM, COP, ACC and ASEC	2016	AMS	AMS	
7. Enhance Appropriate Measures in Monitoring, Assessment and Early Warning Systems to Prevent Transboundary Haze Pollution arising from Land and /or Forest Fires	Interim ACC (ASEAN Secretariat), ASMC, ACC, ASMC, NMCs	2016 2018	AMS	AMS	
8. Enhance and implement Work Programme	AMS, ASEAN Secretariat, ACC	2016	AMS	AMS	

Action	Responsible Parties	Time Period	Target Areas	Resources	Measure of Progress
9. Ensure regular reporting of the Work Programme at the COP	AMS, ASEAN Secretariat, ACC	2016	COP	AMS	

Strategy 2: Sustainable Management of Peatlands for Peatland Fires Prevention

This key strategy supports the implementation of the ASEAN Peatland Management Strategy (APMS) 2006-2020 and the ASEAN Programme for Sustainable Management of Peatland Ecosystems (APSMPE) 2014-2020.

Proposed actions for the strategy include those to be taken at the regional level and those that relevant AMS should consider implementing and including in their respective National Action Plans on Peatlands (NAPPs).

Measures of Progress

- Decrease in the number of hotspots in peatland area
- Decrease in area of peatland burnt
- Decrease in allowable controlled-burning cases
- Increase of protected peatland area
- Increase of area of peatland with zero-burning (managed by companies and local communities)

Actions and Logical Frameworks

1. Inventorise all peatland areas
 - a. for *Mekong Sub-Region and the Philippines*:
 - Completely identify all peatland areas
 - Completely assess the status of peatlands
 - b. for *Southern ASEAN Sub-Region*:
 - Completely assess the status of peatlands
2. Intensify implementation of APMS and National Action Plans on Peatlands
 - a. for *Mekong Sub-Region and the Philippines*:
 - Complete the National Action Plan on Peatlands
 - b. for *Southern ASEAN Sub-Region*:
 - Implement the National Action Plan on Peatlands and report on the progress
3. Promote integrated water resources and peatland management using as basin-wide approach and avoiding fragmentation
4. Implementation of zero-burning for all peatlands and allow controlled-burning only in exceptional cases
5. Ensure effective prevention and rapid deployment of resources and early suppression of peatland fires (following ASEAN Guidelines on Peatland Fire Management)
6. Rehabilitate degraded and fire-prone peatlands by focusing on root causes of fire
7. Conserve priority peatland areas

Action	Who	When	Where	Resources	Measure of Progress
Strategy 2: Sustainable management of peatlands through implementation of the ASEAN Peatland Management Strategy (APMS) to prevent large-scale peatland fires					
1. Inventories all peatlands in the ASEAN region (APSMPE) 1.a. Mekong Sub-region + Philippines - Complete identification of all peatlands - Complete the assessment of the status of peatlands 1.b. Southern ASEAN Sub-region - Complete the assessment of the status of peatlands	All AMS	1.a. 2018 for identification; 2020 for assessment 1.b. 2018	Mekong sub-region + Philippines Southern ASEAN sub-region	Provided by APSMPE, AMS	<ul style="list-style-type: none"> • Protected peatland area increased • Reduction in area of peatland burnt • Area of peatland managed by companies and communities with zero-burning increased • Decrease in allowable controlled-burning cases • Decrease in the number of hotspots in peatland area
2. Intensify implementation of APMS and national action plan on peatlands [APSMPE, KT 2020, No.6] 2.a. Completion of the national action plan on peatlands (3 countries) 2.b. Implementation and reporting on progress	All AMS	2.a. 2020 (after completing inventory) 2.b. Ongoing	ASEAN region	AMS	

Action	Who	When	Where	Resources	Measure of Progress
3. The integrated management plan of peatland with a focus on water implemented [APMS: 8.2, p.16] 3.a. Mekong sub-region + Philippines 3.b. Southern ASEAN sub-region	All AMS	3.a. 2020 3.b. 2019	ASEAN region (identified peatlands)	Provided by APSMPE, AMS	
4. Conserve priority peatland areas [APMS, p.16]	All AMS	2019	ASEAN region	Provided by APSMPE, AMS	
5. Zero-burning is implemented for peatlands and controlled-burning is allowed only in exceptional cases. [APSMPE KT 2020 No.2]	All AMS	2017	ASEAN region	AMS	
6. Ensure effective prevention and rapid deployment of resources and early suppression of peatland fires (follow ASEAN guideline on Peatland Fire management)	Relevant AMS	2019	ASEAN region	Provided by AMS supported by APSMPE	
7. Rehabilitate burnt, drained and degraded peatland by focusing on root causes of fire [APSMPE, KT 2020, No.3]	Relevant AMS	2020	ASEAN region	Provided by AMS supported by APSMPE	

Strategy 3: Sustainable Management of Agricultural Land and Forest to Prevent Large Scale Forest and/or Land Fires

For effective fires prevention in agricultural land and forest, mechanisms on sustainable agricultural land and forest are required. Regulations should be effectively implemented at all levels and sustainable forest management plan should be developed and implemented. In this regard, promotion of zero burning and controlled burning for agricultural land management remains relevant and needs to be strengthened. Relevant regulations and/or incentives for haze-free and/or zero burning practices will also need to be developed, familiarised and implemented. Priority prevention measures should be identified through assessment of the root causes and drivers of large scale land and forest fires.

Measures of Progress

- Decrease in the number of hotspots
- Decrease in area of burnt area
- Decrease open burning activities in the agricultural land and forest areas
- Increase of number of regulations and/or incentives for haze free and/or zero-burning practice
- Effective implementation of regulations and/or incentives for haze free and/or zero-burning practice

Actions and Logical Frameworks

1. Assess root causes and drivers of large scale land and forest fires to identify priority prevention measures
2. Develop and implement sustainable forest management plan in reserved and protected forest area
3. Strengthen forest and land fire prevention
4. Control fire-prone forest area using early detection for forest management
5. Promote and support the zero-burning and controlled-burning for agricultural land management
6. Develop and promote techniques for controlled-burning particularly for shifting cultivators and small farmers
7. Promote appropriate method for disposal or use of agricultural waste including development of market for utilisation of bio-mass

Action	Who	When	Where	Resources	Measure of Progress
Strategy 3: Sustainable management of agricultural land and forest (non-peatland) to prevent large-scale land and forest fires					
1. Control fire-prone forest area using early detection for forest management	Government staff and trained local community	Immediate	Provincial level and district level	Government and private sector	<ul style="list-style-type: none"> • Reduction of the number of hotspots and/or size of burnt area • Decrease open burning activities in the agricultural land and forest areas by local communities and private companies • Number of regulations and/or incentives for haze free and/or zero burning practice
2. Develop and implement sustainable forest management plan in reserved and protected forest area	National and local government, community, private sector	Immediate	Fire-prone forest area	National and local government, ASEAN dialogue partners, private sector and other International donors	
3. To promote and support the zero burning and controlled burning for agricultural land management	Government agencies concern with land-use management , private sector, local community	Immediate	All agricultural land: rice field, sugarcane, corn, palm oil, rubber, other crops under which are fire-prone	National and local government, private sector, external funding	
4. Strengthen forest and land fire prevention	Government agencies concerned	Immediate, before dry season	Fire-prone areas	National and local government, private sector (plantation owned)	

Action	Who	When	Where	Resources	Measure of Progress
				company), external funding	
5. Assessment of root causes and drivers of large scale land and forest fires to identify priority prevention measures	Government agencies concerned	2016-2017	Fire-prone areas	National	
6. Develop and promote techniques for controlled burning particularly for shifting cultivators and small farmers	AMS, ACC, research institutions	2016-2020	Fire-prone areas	AMS, Haze Fund	
7. Promote appropriate method for disposal or use of agricultural waste including development of market for utilisation of bio-mass	AMS, ACC, research institutions	2016-2020	Fire-prone areas	AMS, Haze Fund	

Strategy 4: Strengthening Policies, Laws, Regulations and their Implementations, including to facilitate exchange of experience and relevant information among enforcement authorities of the Parties in accordance with the AATHP Article 16 (f)

To effectively implement the AATHP, supporting policies, laws and regulations need to be developed and the existing ones to be strengthened, subject to capacity and capability of the respective member states. But more importantly, these policies, laws and regulations should be enforced and complied with, at all levels. At the regional level, development of protocols under the AATHP should be explored to address specific components in the Agreement.

Measures of Progress

- Adequate number of laws and regulations developed
- Effective enforcement of laws and regulations

Actions and Logical Frameworks

1. Review current regional procedures and mechanisms, and explore the development of protocols under AATHP
2. Conduct regional workshop to share good practices in developing and implementing legislative instruments and regulations
3. Review and improve existing legislative instruments and regulation
4. Formulate regulations and incentives for haze free
5. Use multi-door approach to law enforcement

Action	Who	When	Where	Resources	Measure of Progress
Strategy 4: Strengthening Policies, Laws, Regulations and their Implementations, including to facilitate exchange of experience and relevant information among enforcement authorities of the Parties in accordance with the AATHP Article 16 (f);					
1. Formulation of regulation and incentives for haze free	National government, relevant agencies	Immediate	National and local levels (province & district)	National and local government budget, external funding	<ul style="list-style-type: none"> Adequate laws and regulations developed and effectively enforced
2. Review and improve existing legislative instruments and regulations	National and local government	Immediate	National and local levels (province & district)	National and local government budget, external funding	
3. Conduct regional workshop to share good practices in developing and implementing legislative instruments and regulations	COM, ASEAN Secretariat	2017	AMS	AMS, Haze Fund	
4. Use multi-door approach to law enforcement	National law: criminal, forest conservation, land use, agriculture, environment	Immediate	Fire-prone areas	National and local government budget, external funding	
5. Review current regional procedures and mechanisms, and explore the development of protocols under AATHP	COM, ASEAN Secretariat	Immediate	AMS	AMS	

Strategy 5: Enhancing Cooperation, Exchange of Information and Technology, and Strengthening of Capacity of Institutions at All Levels

Sharing information and strengthening institutional capacity at all levels are critical to enable effective implementation of AATHP. Exchange of information and technology not only among local agencies and stakeholders but also among AMS, will facilitate replication of best practices in land and/or forest fire management and promote better coordination and cooperation. Strengthening institutional capacity needs to be backed up by strong scientific and technical research, which will facilitate greater understanding and better preparedness and response in addressing transboundary haze pollution issues in the region.

Measures of Progress

- Adequate number of cooperation projects implemented
- Strengthened capacity of institutions
- Adequate number of success stories shared

Actions and Logical Frameworks

1. Enhance and implement regional/national cooperation projects to strengthen capacity on fire prevention and preparedness
2. Share best practices on forest and agricultural land management at all levels
3. Explore mechanism for National Monitoring Center (NMC) and other agencies to share information indicated in AATHP, pursuant to national laws and regulations with all stakeholders
4. Strengthen institutions at regional, sub-regional, national and local level on coordination and exchange of information, fire prevention, preparedness, and control.
5. Enhance and support scientific and technical research programme related to the root causes and consequences of transboundary haze pollution and means, methods, techniques and equipment for forest and/or land fire management including fires fighting
6. Train volunteers to be a part of prevention and fire fighting

Action	Who	When	Where	Resources	Measure of Progress
Strategy 5: Enhancing Cooperation, Exchange of Information and Technology, and Strengthening of Capacity of Institutions at All Levels					
1. Sharing best practice information on forest and agricultural land management at all levels	Regional, sub-regional, national and local level	Immediate	National and local communities	National and local government, external funding (ASEAN haze fund, international partners)	<ul style="list-style-type: none"> • Capacity of institutions strengthened • Number of success stories shared • Number of cooperation projects implemented
2. Training volunteers to be a part of prevention and fire fighting	Provincial and local level	Immediate	Local communities in the fire-prone area	National and local government, external funding, private sector	
3. Strengthen institutions at regional, sub-regional, national and local level on coordination and exchange of information, fire prevention, preparedness, and control.	Regional, sub-regional, national and local level	Immediate	Regional, sub-regional, national and local level	National and local government, external funding (ASEAN haze fund, international partners)	
4. Enhance and implement regional/national cooperation project to strengthen capacity on fire prevention and preparedness	Regional, sub-regional, national and local level	Immediate	Regional, sub-regional, national and local level	National and local government, external funding (haze fund, international partners)	
5. Explore mechanism for National Monitoring Center and other agencies to share information indicated in AATHP, pursuant to national laws and regulations with all stakeholders	AMS/NMC coordinated by ACC	Immediate and continuous	AMS	AMS, ACC haze fund and donors	

Action	Who	When	Where	Resources	Measure of Progress
6. Enhance and support scientific and technical research programme related to the root causes and consequences of transboundary haze pollution and means, methods, techniques and equipment for land and/or forest fire management including fires fighting	AMS, research institution	Immediate and continuous	AMS	AMS, ACC, haze fund and donors	
7. Encourage AMS to take necessary actions to operationalise the ASEAN Sub-Regional Haze Monitoring System	MSC Countries	Continuous	MSC Countries	MSC Countries	Report to MSC on progress

Strategy 6: Enhancing Public Awareness and Cross-Sectoral and Stakeholders Participation

To attain the goals of the Roadmap, involvement from all relevant sectors and stakeholders is crucial. Effective collaboration among relevant sectors and stakeholders has to be promoted. More importantly, public awareness to address haze pollution including the relevant policies and regulation, the impacts and risks of land and forest fires, need to be created and the existing ones to be enhanced. The private sector is an important stakeholder in this matter and should be actively engaged.

Measures of Progress

- Adequate number of campaign programmes
- Adequate number of cross-sectoral and/or multi-stakeholder dialogues/forums
- Adequate number of projects with cross-sectoral and/or multi-stakeholder participation
- Effective implementation of projects with cross-sectoral and/or multi-stakeholder participation
- Adequate number of private sectors implementing CSR with a focus on forest and/or land fires prevention and control.
- Effective implementation of CSR

Actions and Logical Frameworks

1. Formulate and implement a comprehensive education, communication and information campaign programme to address haze pollution including the impacts and risks of forest and/or land fires
2. Conduct dialogues/forums involving relevant sectors and stakeholders to garner support for the implementation of the Roadmap
3. Encourage proactive involvement of local communities to prevent forest and/or land fires
4. Implement community based forest management (to engage stakeholders in protection of the forest)

Action	Who	When	Where	Resources	Measure of Progress
Strategy 6: Enhancing public awareness, cross-sectoral and stakeholders participation					
1. Implementing community based forest management (to engage stakeholders in protection of the forest)	Government. agencies of concern, local community	Immediate (depending on national circumstances)	Accessible forest area of ASEAN	National and local government, external funding, private sector	<ul style="list-style-type: none"> • Number of cross-sectoral and/or multi-stakeholder forums/dialogues • Number of projects with cross-sectoral and/or multi-stakeholder participation • Number of private sectors implementing CSR
2. Encouraging proactive involvement of local communities to prevent land and forest fire	Provincial and local level	Immediate	Local communities in fire-prone areas	National and local government, external funding, private sector	
3. Formulating a comprehensive education, communication and information campaign programme to address haze pollution including the effects and risks of forest and land fires	Regional level (COM, ACC, ASEAN Secretariat), National level, provincial level, local level	Immediate	National level, provincial level, local level		
4. Conduct dialogues involving relevant sectors and stakeholders to garner support for the implementation of the Roadmap	COM, ACC, ACB, and ASEAN Secretariat, SOM-AMAF	Starting from 2016 (after the Roadmap's endorsement)	AMS	AMS, Haze Fund, external funding	

Strategy 7: Securing Adequate Resources from Multi-Stakeholders for Preventing Transboundary Haze
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This strategy mainly contributes to the fulfillment of the implementation of the Roadmap. The focus is on the mobilisation of financial, human, and technological resources.

Measures of Progress

- Adequate amount of resources mobilised
- Effective mobilisation of resources
- Adequate number of multi-stakeholder contribution
- Effective contribution from multi-stakeholders

Actions and Logical Frameworks

1. Mobilise adequate financial resources to fully implement the Roadmap
2. Mobilise adequate human resources to fully implement the Roadmap
3. Mobilise adequate technological resources (including monitoring, fire suppression equipment)

Action	Who	When	Where	Resources	Measure of Progress
Strategy 7: Securing adequate resources from multi-stakeholders for preventing transboundary haze					
1. Mobilise adequate financial resources (from government, donors, private sector etc.) to fully implement the Road Map	AMS, ACC, ACB, ASEAN Secretariat	Ongoing	AMS	ASEAN dialogue partners, private sector, foundations, climate/ biodiversity related financing mechanisms, (I)NGOs, international organisations	<ul style="list-style-type: none"> • Amount of resources mobilised • Number of stakeholder contribution
2. Mobilise adequate human resources (from government, donors, private sector etc.) to fully implement the Road Map	AMS, ACC, ACB, ASEAN Secretariat	Ongoing	AMS	Incentives, remuneration as appropriate, private sector, foundations, (I)NGOs, International Organisations, communities	
3. Mobilise adequate technological resources (including monitoring, fire suppression equipment)	AMS, ACC, ASMC	Ongoing	AMS	AMS, ASEAN dialogue partners, private sector, foundations, (I)NGOs, International Organisations, communities	

Strategy 8: Reducing Health and Environmental Risks and Protection of Global Environment.
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To contribute to the ASEAN Socio-Cultural Community (ASCC) Blueprint 2025 vision and the advocacy to the global environment, this key strategy focuses on reducing health and environmental risks and protecting global environment from haze pollution arising from land and forest fires.

Measures of Progress

- Reduction or avoidance of health and environmental impacts
- Adequate and effective assessment and monitoring of the health, economic, social and environmental impacts of haze pollution
- Effective database on impacts of haze and public health
- Effective communication to raise public awareness about haze pollution, health and environmental risks

Actions and Logical Frameworks

1. Review relevant information and establish common database on impacts of haze on public health
2. Undertake assessment and monitoring of the health, economic, social and environmental impacts of haze including climate change/global warming
3. Introduce health risk reduction measures (such as masks, warnings, evacuation plan)
4. Increase public awareness about the impacts of haze pollution on health.

Action	Who	When	Where	Resources	Measure of Progress
Strategy 8: Reducing health and environmental risks and protecting global environment					
1. Establish common database on impacts of haze on public health	All AMS/ACC	2016/2017	Affected areas	AMS, potential donors	<ul style="list-style-type: none"> • Health and environmental impacts avoided and/or reduced • Assessment and monitoring of the health, economic, social and environmental impacts of haze undertaken • Database created and maintained
2. Undertake assessment and monitoring of the health, economic, social and environmental impacts of haze including climate change/global warming	All AMS, AWGCC, ATFP	2017	Affected areas	AMS, potential donors	
3. Introduce health risk reduction measures [eg. masks, warnings, evacuation plan]	All AMS	Ongoing	Affected areas	AMS, private sector, potential donors	
4. Increase public awareness about the impacts of haze pollution on health.	All AMS	Immediate	AMS	AMS, potential donors	

6. Means of Implementation

6.1. Institutional Framework

The institutional framework for the implementation of the ASEAN Agreement on Transboundary Haze Pollution (AATHP) shall also be applicable for the implementation of this Roadmap.

The Conference of the Parties (COP) to the AATHP was established in 2003, consisting of the ASEAN Ministers responsible for environment¹. The Committee (COM) under the Conference of the Parties to the AATHP was established to assist COP in the implementation of the Agreement. The COM meets back-to-back and prior to the COP meetings. COP and COM meet back-to-back at least once a year.

In view of different periods of traditional dry season in the northern (Mekong) and southern ASEAN region, two sub-regional ministerial steering committees on transboundary haze pollution were established to address specific haze-related issues occurring in the respective regions: the Sub-regional Ministerial Steering Committee on Transboundary Haze Pollution (MSC), comprising Brunei Darussalam, Indonesia, Malaysia, Singapore and Thailand; and the Sub-regional Ministerial Steering Committee on Transboundary Haze Pollution in the Mekong Sub-region (MSC Mekong) comprising Cambodia, Lao PDR, Myanmar, Thailand, and Viet Nam. Both MSC and MSC-Mekong have met separately on an annual basis. Each MSC and MSC Mekong is supported by a technical working group (TWG and TWG Mekong).

6.2. Cross-Sectoral Coordination

Due to the cross-sectoral nature of environmental issues, coordination among relevant agencies at national level and among sectoral bodies at regional level shall be strengthened.

Coordination shall be encouraged not only among ASOEN subsidiary bodies, but also with other sectors under ASCC pillar, and with APSC and AEC Pillars.

An institutionalised cross-sectoral coordination mechanism may be established in the future upon consultation among COM, ASOEN and other concerned sectoral bodies.

6.3. Collaborative Partnership

The implementation of the Roadmap shall be driven by AMS with support from the ACC and the ASEAN Secretariat. However, effective collaborative partnership is equally important.

Existing and potential partners are ASEAN Dialogue and development partners, international organisations, private sector, civil society, local governments, academia, and media. Multi-stakeholder partnership shall be encouraged for the implementation of the Roadmap for inclusivity and effectiveness.

ASEAN Environment Day, which is to be held regularly back-to-back with AMME/COP, could serve as a platform for multi-stakeholder dialogue on environmental and transboundary haze pollution issues and an opportunity to explore joint initiatives.

¹ In the case of Viet Nam, Minister of Agriculture and Rural Development

Proposed initiatives by external partners shall be in line with and contribute to the identified priority areas in the Roadmap and subject to review and approval of COM.

7.4. Resource Mobilisation

Resource mobilisation strategy shall be developed to support the implementation of the Roadmap.

Donor forums or partnership conferences could be organised on a regular basis to provide a platform for partners and stakeholders to discuss potential collaboration.

Scaling up of contribution to the Haze Fund from external sources, including non-traditional sources such as private sector shall be explored. Provision of interim staff support (while waiting for the full operationalisation of ACC) shall be considered as part of strategies for resource mobilisation.

7.5. Communication Strategy

A strategy on how to effectively communicate the importance of fire and haze control and the role of ASEAN in promoting haze-free ASEAN shall be developed.

The strategy could include a range of tools and initiatives such as existing official stakeholder forum (regional and national level), website, networking group by email, media and communication plan for managing haze crisis in ASEAN.

7.6. Reporting, Monitoring and Evaluation

ACC THPC shall undertake responsibilities for the following areas:

Reporting

- Annual progress reports to be prepared by ACC THPC and ASEAN Secretariat for presentation to COP
- Annual updates at TWG/MSC and TWG/MSC Mekong on relevant strategies and actions in the Roadmap

Monitoring

- Indicators shall be developed in line with the proposed ASCC Blueprint 2025 Results Framework, which is being developed as part of the ASCC Blueprint 2025 Monitoring and Evaluation System.

Evaluation

- Development of guidelines for evaluation of progress (Mid-term and Final review)

ANNEX 1

Initiatives and Achievements

In response to the transboundary haze problem in Southeast Asia, the Government of Indonesia called for international cooperation to support national forest fire management capability resulting in an arrangement of an international conference on "Long-Term Integrated Forest Fire Management" held in Bandung in June 1992. After that, several international cooperative initiatives including workshops, conferences and training programs were instituted. The preliminary initiatives mostly focused on Indonesia which is the main source of the fires causing haze problem.

Subsequently, ASEAN actively collaborated intra-regionally and internationally to improve technical, legal and institutional capacities of member countries in addressing the problems and minimising their impacts. Several mechanisms varying in practice from policy dialogue, technical cooperation to project-based activities were established. On top of the development of institutional structure and strategic plans, other ASEAN initiatives include detailed operational procedures for monitoring, assessment and joint emergency response, an inventory of fire-fighting resources and training mechanisms. International contributions play very important role particularly in technical assistance and financial support. Key ASEAN initiatives on transboundary haze problem are summarised as Table 5.

Table 5. Chronology of ASEAN's initiatives on transboundary haze pollution.

Year	ASEAN's Initiatives
1992	The issue of transboundary pollution was first highlighted at the 4 th ASEAN Ministerial Meeting on the Environment (AMME).
1993	ASEAN Specialised Meteorological Centre (ASMC) was established as a regional collaboration programme among the National Meteorological Services (NMSs) of ASEAN Member States. Later, in 1997 under RHAP, the ASMC was appointed to monitor and assess land and forest fires and the occurrence of transboundary smoke haze affecting the southern ASEAN region, and in 2003 (under the AATHP), ASMC's role was further extended to cover the whole ASEAN region.
1995	ASEAN Meeting on "the Management of Transboundary Pollution" was held in Kuala Lumpur. The Meeting proposed for ASMC to undertake the additional role of a focal point for coordinating the detection and monitoring of transboundary atmospheric pollution and to develop models for predicting the spread of smoke haze. This proposal was accepted by the ASEAN Sub-Committee on Meteorology and Geophysics (SCMG), a sub-committee of COST at its 18 th Meeting in Thailand in July 1995. The SCMG also agreed on a haze alert warning system which spells out the procedures and actions to be taken by the members concerned in the event of occurrence of fire and haze.

Year	ASEAN's Initiatives
	<p>ASEAN Cooperation Plan on Transboundary Pollution (ACPTP) was adopted at AMME.</p> <p>The plan elaborates objectives, strategies, activities and institutional arrangements and lists potential sources of technical expertise and financial assistance that are available or can be mobilised to assist the plan's implementation.</p> <p>The ACPTP also called for the establishment of National Focal Point (NFCs) for strengthening regional coordination regarding the fire and haze issue.</p> <p>ASEAN Seniors Officials on the Environment-Haze Technical Task Force (ASOEN - HTTF) was established during the 6th Meeting of the ASEAN Senior Officials on the Environment (ASOEN) to actively implement ACPTP.</p> <p>Its aims are to assess the origin and causes of local and regional haze incidents; to prevent and control the sources of haze at both national and regional levels; and to develop and implement national and regional emergency response plans.</p>
1997	<p>The 1st ASEAN Ministerial Meeting on Haze (AMMH) was specifically convened to address the problem of haze in the region caused by forest and/or land fires.</p> <p>The 3rd Informal ASEAN Ministerial Meeting on the Environment (IAMME) proposed and agreed that the role of ASMC be expanded to include the application of remote sensing techniques to monitor the environmental effects of haze, to conduct research, monitoring and early warning system of widespread haze.</p> <p>ASEAN Regional Haze Action Plan (RHAP) formulated by ASOEN - HTTF was endorsed by AMMH.</p> <p>The primary objectives of the plan are to prevent land and forest fires through better management policies and enforcement; to establish operational mechanisms to monitor land and forest fires; and to strengthen regional land and forest fire-fighting capability and other mitigating measures.</p>
1998	<p>Hanoi Plan of Action was adopted at the ASEAN Summit and established a procedure for facilitating the movement of fire fighting resources.</p> <p>Sub-Regional Fire-Fighting Arrangements (SRFA) for Borneo and the Sumatra/Riau provinces in Indonesia were established under the <i>Hanoi Plan of Action</i>.</p> <p>The ASMC website was launched to provide NMSs and organisations involved in RHAP related activities with information such as daily land/forest fire and smoke haze monitoring and hotspot coordinates, latest and archived satellite images, regional low-level winds, monthly weather and haze reviews and seasonal climate outlook</p>

Year	ASEAN's Initiatives
	<p>A Framework for an ASEAN Regional Fires Suppression Mobilisation Plan was developed.</p> <p>The objective of the plan is to provide the ability to deal with a range of situations and contingencies faced by those implementing and cooperating in the mobilisation plan. The plan would position and utilise fire suppression resources, in a timely and cost effective manner, to meet anticipated and existing needs regardless of geographic or national affiliations.</p>
1999	<p>Zero burning policy targeted at plantation companies and timber concessionaires was adopted by the ASEAN Environment Ministers.</p> <p>ASEAN Haze Action Online was launched for monitoring RHAP implementation. It also provides public-access website on fire and transboundary haze.</p> <p>The Southeast Asia Fire Danger Rating System (FDRS), as part of RHAP, was developed for Indonesia and Malaysia as a monitoring and early warning system of fire danger conditions that cause haze and vegetation fire problems.</p> <p>The system was initially implemented by the Canadian Forest Service.</p>
2000	<p>The Sub-Regional Climate Review Group was established to closely monitor the weather condition especially during the dry seasons.</p> <p>The SRFA Legal Group on Law and Enforcement was established to discuss legal and law enforcement matters and the implementation of zero burning policy among all relevant parties.</p>
2002	<p>The ASEAN Agreement on Transboundary Haze Pollution (AATHP) was signed by all ASEAN Member States.</p> <p>The objective of the Agreement is to prevent and monitor transboundary haze pollution resulting from forest and/or land fires through concerted national efforts, and intensified regional and international cooperation.</p> <p>The Agreement contains measures on monitoring and assessment; prevention; preparedness; national and joint emergency response; procedures for deployment of people, materials and equipment across borders; and technical cooperation and scientific research.</p> <p>The AATHP also called for the establishment of an ASEAN Coordinating Centre for Transboundary Haze Pollution Control (ACC) for the purposes of facilitating co-operation and co-ordination among the Parties in managing the impact of forest and/or land forest and/or land fires in particular haze pollution arising from such fires.</p>
2003	<p>The Guideline for the Implementation of the ASEAN Policy on Zero Burning was developed by ASOEN – HTTF and the Government of Malaysia with financial contributions by external donors (the Global Environment Facility/UNEP, East Asia and Pacific Environmental Initiative/US Department of Agriculture Forest Service).</p>

Year	ASEAN's Initiatives
	<p>The Malaysian Meteorological Service (MMS) started their responsibility in producing the FDRS products on a daily basis.</p> <p>The Conference of the Parties (COP) to the ASEAN Agreement on Transboundary Haze Pollution was established, consisting of the ASEAN Ministers responsible for environment.</p> <p>The ASEAN Peatland Management Initiative (APMI) was endorsed.</p> <p>The initiative was established in collaboration with the Global Environment Center, an NGO focusing on peatland conservation in the region.</p> <p>Its goals are to promote sustainable management of peatlands through collective efforts and enhanced cooperation among ASEAN member countries towards achieving local community support and sustaining traditional livelihood options; to promote regional benefits through reduced risk of fire and associated haze; and to contribute globally in minimising impacts of climate change as a result of carbon release from peatlands.</p>
2004	<p>The 1st Meeting of the Conference of the Parties (COP-1) to the ASEAN Agreement on Transboundary Haze Pollution was held.</p> <p>This Meeting reaffirmed that the ASEAN Coordinating Centre (ACC) should play a facilitating and coordinating role in implementing the provisions of the Host Government Agreement, and further reaffirmed that the ASEAN Specialised Meteorological Centre shall continue to perform its monitoring and early warning functions under this Agreement.</p>
2005	<p>A Panel of ASEAN Experts on Fire and Haze Assessment and Coordination was established.</p> <p>The Panel of Experts developed the operational procedures for the activation of the experts, deployment procedures, execution, demobilisation, and reporting procedures.</p>
2006	<p>The Sub-Regional Ministerial Steering Committee (MSC) on Transboundary Haze Pollution, comprising Brunei Darussalam, Indonesia, Malaysia, Singapore and Thailand was established.</p> <p>It is supported by a Technical Working Group (TWG) on Transboundary Haze Pollution.</p> <p>The ASEAN Peatland Management Strategy (APMS) was endorsed by ASEAN Environment Ministers.</p> <p>Under the APMI and AATHP, APMS focuses on enhancing awareness and knowledge on peatlands; addressing transboundary haze pollution and environmental degradation; promoting sustainable management of peatlands; and enhancing and promoting collective regional cooperation on peatland issues.</p>

Year	ASEAN's Initiatives
2007	<p>At the COP-2 meeting, the Ministers adopted the financial rules for the ASEAN Transboundary Haze Pollution Control Fund and agreed to establish the fund by providing an initial target amount of US\$500,000.</p> <p>The ASEAN Haze Fund was established for the implementation of the AATHP.</p> <p>At the COP-2 meeting, the Ministers had also agreed that the ASEAN Coordinating Centre (ACC) should leverage the capabilities of existing resources within the region, such as the ASEAN Specialised Meteorological Centre (ASMC) in the provision of weather, climate information and early warning functions for the region. The ASMC will complement and support the ACC in these specialized areas.</p> <p>The Committee (COM) under the Conference of the Parties to the ASEAN Agreement on Transboundary Haze Pollution was established to assist COP in the implementation of the AATHP.</p> <p>The Technical Working Group on Transboundary Haze Pollution in the Mekong Sub-Region (TWG Mekong) was established.</p> <p>The 1st Meeting of the TWG Mekong was held.</p>
2010	<p>The Sub-regional Ministerial Steering Committee on Transboundary Haze Pollution in the Mekong Sub-region (MSC Mekong) comprising Cambodia, Lao PDR, Myanmar, Thailand, and Viet Nam was endorsed by the COP-6 meeting.</p> <p>The objective of the MSC Mekong is to oversee programmes and activities to enhance cooperation among ASEAN Member States in the Mekong Sub-Region on fire and haze pollution control.</p>
2011	<p>The 1st Meeting of the Sub-Regional Ministerial Steering Committee on Transboundary Haze Pollution in the Mekong Sub-Region was held.</p>
2013	<p>The ASEAN Task Force on Peatlands (ATFP) was established to assist COP in monitoring and supporting the implementation of the APMS, APSMPE and other relevant programs/projects.</p> <p>The APMS was updated to guide actions to support management of peatlands in the ASEAN region in the period of 2006-2020.</p> <p>The ASEAN Programme on Sustainable Management of Peatland Ecosystems (APSMPE) 2014-2020 was endorsed.</p>
2014	<p>The ASEAN Agreement on Transboundary Haze Pollution (AATHP) was ratified by all ASEAN member countries.</p> <p>At the COP-10 Meeting, the Alert Levels, Trigger Points and Actions on Fire Suppression was refined, to complement and enhance the existing Standard Operating Procedure (SOP) for Monitoring, Assessment and Joint Emergency Response under the AATHP.</p>
2015	<p>At the COP-11 Meeting, the revised Standard Operating Procedure (SOP) for Monitoring, Assessment and Joint Emergency Response under the AATHP was endorsed.</p>

Year	ASEAN's Initiatives
	<p>At the COP-11 Meeting, <i>ASEAN Guidelines on Peatland Fire Management</i> was endorsed.</p> <p>The guidelines were developed to serve as a reference to implement in applying holistic Integrated Fire Management (IFM), supported by Community-Based Fire Management (CBFiM) in preventing and managing peatland fires.</p>

Achievements of ASEAN initiatives involve improvement of both fire management and forest and peatland resources management in national level. Participation of the relevant stakeholders in particular local communities on fire management is enhanced while mechanisms on forest and particularly peatland resources management are improved. National Action Plans on Peatlands (NAPPs) of six AMS were approved and some of those have already been implemented. There are also some positive changes on the operational behavior of palm oil plantation companies which include an adoption of zero burning method by the Roundtable on Sustainable Palm Oil (RSPO) and development and implementation of RSPO manual on Best Management Practices (BMP) for oil palm plantation on peat.

However, to further enhance ASEAN's capabilities on addressing the transboundary haze pollution, there is a need to fully implement the AATHP through developing a Roadmap on ASEAN Cooperation towards Transboundary Haze Pollution Control with Means of Implementation.
