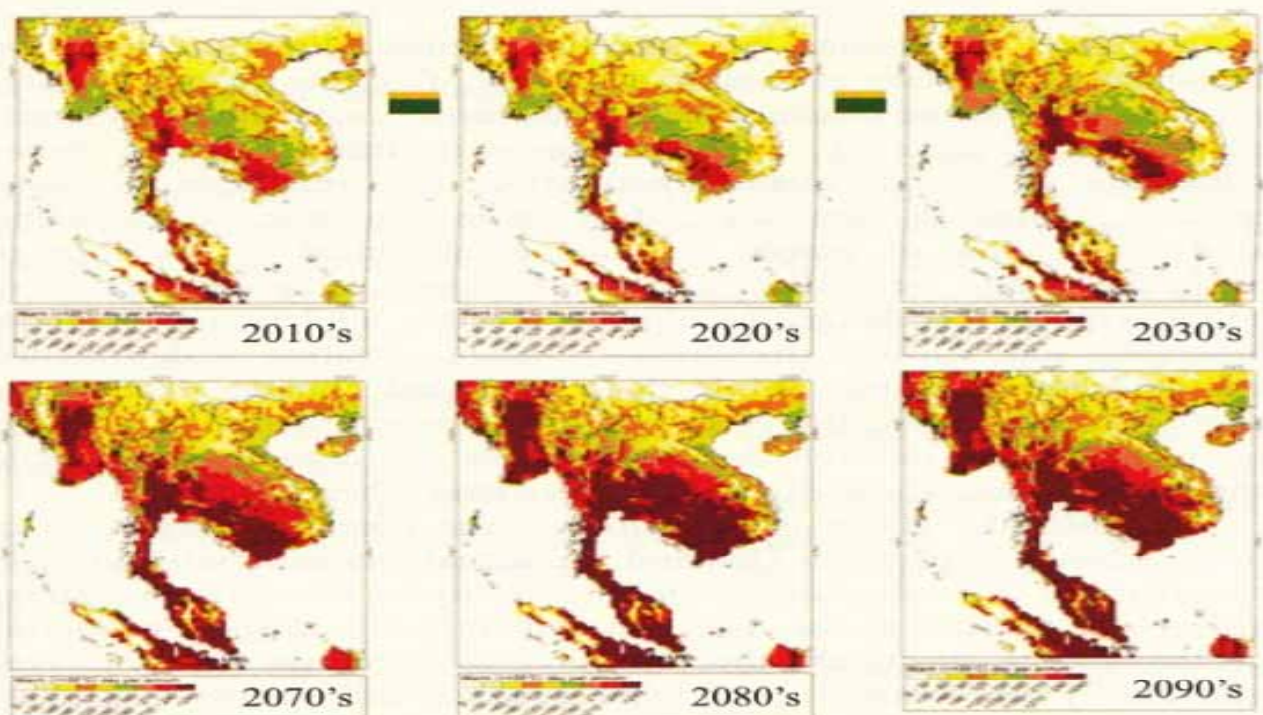


# ADAPTING TO CLIMATE CHANGE : THAILAND EXPERIENCE AND CHALLENGES



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**Figure 1- Area of Hot Days with Maximum  
Temperatures Over 35°C (2010—90)**



*Source:* Anond Snidvongs (2009).  
*Note:* Hot days ( $\geq 35^\circ\text{C}$ ) per annum.



⇒ The average annual temperature will continue to increase.

- approximately 1°C in all regions (2010-30s)
- approximately 2°C by 2050s
- approximately 4°C by 2080s



## The number of hot day.



- ⇒ over 35°C in all regions (1970-1989)
- 139 days per year
  - 172 days per year (2010-2030s)
  - 208 days per year (2050s)
  - 251 days (2080s)



- ➡ The annual number of rainy days will decrease in all regions. There will be more heavy rains but fewer rainy days.
- ➡ Increasing sea-surface temperatures may contribute to stronger monsoon winds, causing more violent and frequent storms.



- ➡ Climate change in Thailand are significantly adversely affect the country's water resources, marine and coastal ecosystems, forest, agricultural systems and biodiversity.



- ⇒ The changes in these resource bases will affect socio-economic development.
- ⇒ Additionally, lack of proper resource management in the face of change may cause the underlying natural systems to be less capable of coping with the challenges of climate change, rendering them more vulnerable and sensitive to climate change, creating a detrimental positive feedback loop.
- ⇒ Risk and impacts will certainly vary by region, depending on both the environment and capacity to adapt to change, with some areas affected for more than others.

- ⇒ The first three groups are identified as those most likely to be affected by climate change.

Group 1 : Physical Systems, Infrastructure, Settlements and Tourism

Group 2 : Agriculture

Group 3 : Health and Public Health





⇒ A rising sea level is one of the most often cited physical risks of climate change in Thailand, across 27 provinces.



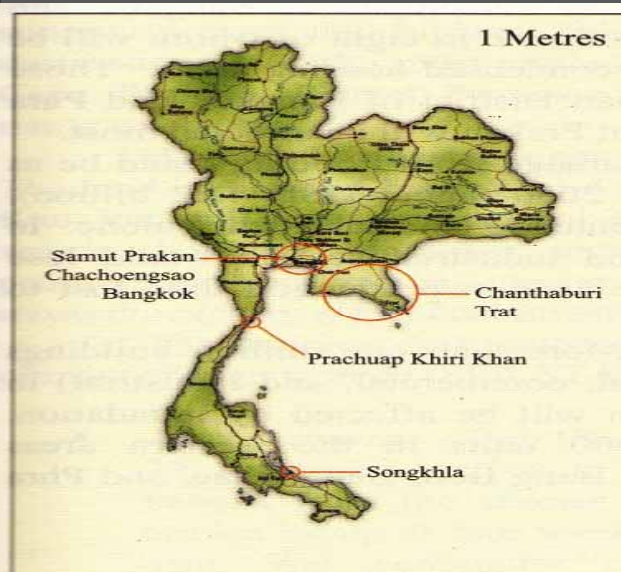
⇒ Since economic growth in Thailand is concentrated in river plains and coastal areas, rising sea levels, flooding and coastal erosion will exacerbate the development effects of climate change.



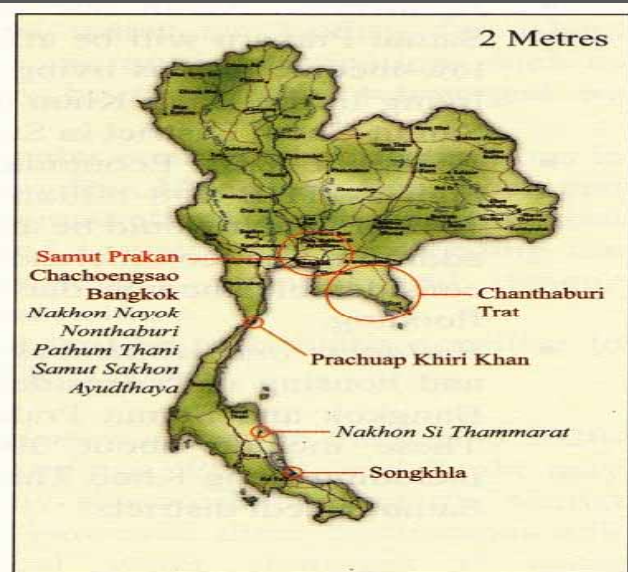
- ➡ The areas most at risk are the Bangkok Metropolitan Area (BMA), the source of 42% of the country's GDP and the delta plains.



## Figure 2-Thiland's Exposure to a Mean Sea Level Rise of 1-2 Metres



Provinces totally submerged: None



Provinces totally submerged:  
Samut Prakan

Source: Adapted from Dasgupta, et al. (2007).

**Note:** Estimation of submerged areas by the Public Policy Studies Institute, Chiang Mai University. Provinces in italics are those additionally flooded by a mean sea level rise of >1 metre and ≤2 metres.



# URBAN AREAS

⇒ By 2050, the impacts of flooding and seawater incursion in the BMA will include

- Residents – 1 millions inhabitants in BMA and Sumutprakarn province.
- Economic loss- THB 148 billion (4.22 billion US\$).
- Building and residence-more than 1 million building and housing.



# TOURISM DESTINATIONS

⇒ Marine tourism along the Andaman coast

- potentially critical water shortage



## ➔ Agro-tourism in the eastern provinces

- slight increase in rainfall and little change in the cooling winter temperatures important for triggering flowering of many fruit tree species.
- higher risks from flashfloods along the steep slopes will work against tourism.



## ➔ Ecotourism

- high temperatures in the summer months will make tourism destinations in the regions more uncomfortable and subject to increase forest fire risk and a loss of biodiversity.





## ➡ Agriculture and Food Security

- Crop production in Thailand is highly climate dependent, with only one-fifth of the cultivated area irrigated.
- Rice production is sensitive to higher temperatures during all of its development stages.



## ➡ Forest Ecosystems and Biological Diversity



➡ Increasing temperatures and fewer rainy days affect the forest ecosystems both directly and indirectly, including higher risks of wildfires, migration of wild fauna, and explosion in the ranges of insect pests, which all affect biodiversity and forests.



## ➡ Health and Public Health

- Increase water-borne infections diseases
- Outbreak of increased spread of parasites like malaria among other increased risks.
- Cardiovascular mortality and respiratory illnesses due to heat waves, infections diseases
- Dengue viruses and mosquito vector.





## Developing a common understanding of the National Adaptation Plans and the National Adaptation Plan Process in Thailand



➡ Adaptation to climate change is becoming a routine and necessary component of planning at all levels.



➡ Thailand recognized the need to address adaptation planning in broader content of sustainable development planning.

## The agreed objectives of the national adaptation process in Thailand are :



a) To reduce vulnerability to the impacts of climate change, by building adaptive capacity and resilience.



## The agreed objectives of the national adaptation process in Thailand are :



b) To facilitate the integration of climate change adaptation into relevant new and existing policies,

programmes and activities, in particular development planning processes and strategies, within all relevant sectors and at different levels, as appropriate.

## The principle to enhance action on adaptation in Thailand



a) Be undertaken in accordance with the Climate Change Convention.

➤ Follow a country-driven, gender – sensitive, fully transparent approach, taking into account vulnerable groups, communities and ecosystems.



## The principle to enhance action on adaptation in Thailand



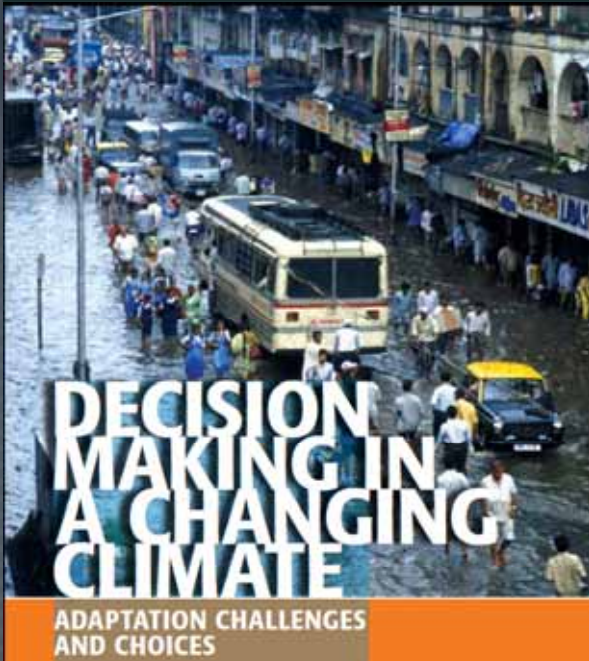
- ▶ Based on the best available science and traditional and indigenous knowledge with a view to integrate adaptation into relevant social, economic and environmental policies and actions
- ▶ Not duplicate of efforts undertaken in country, but facilitate and driven action.

## NATIONAL ADAPTATION PLAN (NAP)

- ▶ The process designed to offer the control and local government an opportunity to work towards transformational change in their capacity to address adaptation.



# NATIONAL ADAPTATION PLAN (NAP)



- ▶ It takes medium and long-term approach to reduce vulnerability to the adverse effects of climate change that is integrated with national development planning processes and strategies.

# NATIONAL ADAPTATION PLAN (NAP)

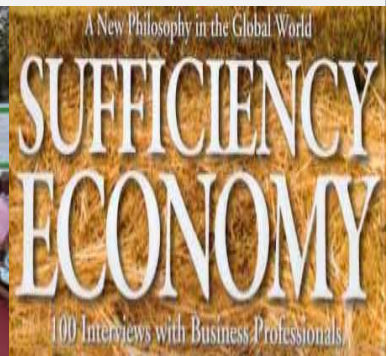
- ▶ NAP process will build upon the achievements and lessons learnt from NAPA process
- ▶ This includes the institutional arrangements and capacity that have built, awareness – raising efforts and assessments that have been undertaken.
- ▶ The plan would be monitored, reviewed and updated periodically.





# NAP PROCESS IN THAILAND

- ◆ Participatory process involving stakeholders.
- ◆ Multidisciplinary and complementary approach, building upon relevant existing plans and programmes
- ◆ Contribution to sustainable development



# NAP PROCESS IN THAILAND

- ◆ Particular consideration to marginalized group such as women
- ◆ Country driven approach
- ◆ Sound environmental management
- ◆ Cost effectiveness
- ◆ Simplicity and flexibility



**TABLE 1. STEPS UNDER EACH OF THE ELEMENTS OF THE FORMULATION OF NATIONAL ADAPTATION PLANS.**

**ELEMENT A. LAY THE GROUNDWORK AND ADDRESS GAPS**

1. Initiating and launching of the NAP process
2. Stocktaking: identifying available information on climate change impacts, vulnerability and adaptation and assessing gaps and needs of the enabling environment for the NAP process
3. Addressing capacity gaps and weaknesses in undertaking the NAP process
4. Comprehensively and iteratively assessing development needs and climate vulnerabilities

**ELEMENT B. PREPARATORY ELEMENTS**

1. Analysing current climate and future climate change scenarios
2. Assessing climate vulnerabilities and identifying adaptation options at the sector, subnational, national and other appropriate levels
3. Reviewing and appraising adaptation options
4. Compiling and communicating national adaptation plans
5. Integrating climate change adaptation into national and subnational development and sectoral planning

**TABLE 1. STEPS UNDER EACH OF THE ELEMENTS OF THE FORMULATION OF NATIONAL ADAPTATION PLANS.**

**ELEMENT C. IMPLEMENTATION STRATEGIES**

1. Prioritizing climate change adaptation in national planning
2. Developing a (long-term) national adaptation implementation strategy
3. Enhancing capacity for planning and implementation of adaptation
4. Promoting coordination and synergy at the regional level and with other multilateral environmental agreements

**ELEMENT D. REPORTING, MONITORING AND REVIEW**

1. Monitoring the NAP process
2. Reviewing the NAP process to assess progress, effectiveness and gaps
3. Iteratively updating the national adaptation plans
4. Outreach on the NAP process and reporting on progress and effectiveness



**Table 2. Main elements and steps of the National Adaptation Plan (NAP) process and key questions to be addressed under each step.**

Steps Key Questions	Steps Key Questions
<b>A. Lay the Groundwork and Address Gaps</b>	
1. Initiating and launching of the national adaptation plan (NAP) process	<ul style="list-style-type: none"> <li>• What is the overall national approach and strategy for the NAP process and what kind of mandate is needed to drive it?</li> <li>• What institutional arrangements are required at the national level to coordinate, lead and monitor the NAP process?</li> </ul>
	<ul style="list-style-type: none"> <li>• What outputs are expected from the NAP process, and when?</li> <li>• What will the reporting arrangements to various stakeholders in the country be?</li> <li>• What technical and financial arrangements are needed and can be mobilized to sustain the process in the short- to long-term?</li> </ul>
2. Stocktaking: identifying available information on climate change impacts, vulnerability and adaptation and assessing gaps and needs of the enabling environment for the NAP process	<ul style="list-style-type: none"> <li>• Where do we stand regarding effective short- and long-term adaptation activities?</li> <li>• What data and knowledge are available to assess current and future climate risks, vulnerability and adaptation?</li> <li>• How can the storage and management of this data and knowledge best be coordinated?</li> <li>• What gaps can be identified regarding the capacity, adequacy of data and information, and required resources to engage in the NAP process?</li> <li>• What barriers exist to effectively plan for, design and implement adaptation?</li> </ul>

**Table 2. Main elements and steps of the National Adaptation Plan (NAP) process and key questions to be addressed under each step**

Steps Key Questions	Steps Key Questions
<b>A. Lay the Groundwork and Address Gaps</b>	
3. Addressing capacity gaps and weaknesses in undertaking the NAP process	<ul style="list-style-type: none"> <li>• How can enabling institutional and technical capacity gaps best be addressed, and which resources are required?</li> <li>• How can long-term capacity development be institutionalized?</li> <li>• How can each of the barriers to adaptation planning be lifted?</li> <li>• Where are there opportunities for integrating climate change adaptation into development planning?</li> </ul>
4. Comprehensively and iteratively assessing development needs and climate vulnerabilities	<ul style="list-style-type: none"> <li>• What key development goals are sensitive to climate change?</li> <li>• How can climate risks to development and potential co-benefits of adaptation and development be identified?</li> </ul>

**Table 2. Main elements and steps of the National Adaptation Plan (NAP) process and key questions to be addressed under each step**

Steps Key Questions	Steps Key Questions
<b>B. Preparatory Elements</b>	
1. Analysing current climate and future climate change scenarios	<ul style="list-style-type: none"> <li>• Which climatic patterns in the country, according to observed data, are most important in terms of adjustment, adaptation or acclimatization of social systems?</li> </ul>
	<ul style="list-style-type: none"> <li>• What risks does climate change hold for the country?</li> <li>• What are major current climate hazards?</li> <li>• What is the estimated range of uncertainty for possible future climate scenarios?</li> <li>• What are appropriate indices of climate trends which could support planning and decisionmaking?</li> </ul>
2. Assessing climate vulnerabilities and identifying adaptation options at sector, subnational, national and other appropriate levels	<ul style="list-style-type: none"> <li>• Which systems, regions, or groups work towards key development goals such as food security, poverty alleviation, economic development, etc?</li> <li>• What are the main climate vulnerabilities of those systems/regions that are key to achieve the main development goals?</li> <li>• What are the expected impacts of climate change?</li> <li>• What are viable cost-effective adaptation options to reduce the impacts of climate change or to exploit opportunities?</li> </ul>

**Table 2. Main elements and steps of the National Adaptation Plan (NAP) process and key questions to be addressed under each step**

Steps Key Questions	Steps Key Questions
<b>B. Preparatory Elements</b>	
3. Reviewing and appraising adaptation options	<ul style="list-style-type: none"> <li>• What are the costs and benefits of each adaptation option?</li> <li>• How best can the adaptation options be implemented, and what are the conditions for success?</li> <li>• Is it possible to identify co-benefits between the adaptation options and development?</li> </ul>
4. Compiling and communicating national adaptation plans	<ul style="list-style-type: none"> <li>• How will priority sectoral and subnational adaptation options be aggregated into national adaptation plans?</li> <li>• How will inputs of all relevant stakeholders be incorporated into producing the national plans?</li> <li>• How can the national adaptation plans and related outputs best be communicated and disseminated at the national level?</li> </ul>
5. Integrating climate change adaptation into national and subnational development and sectoral planning	<ul style="list-style-type: none"> <li>• How can adaptation best be integrated into ongoing development planning processes?</li> <li>• What kind of opportunities can be generated through the integration?</li> <li>• How can the process of integration be facilitated?</li> </ul>



**Table 2. Main elements and steps of the National Adaptation Plan (NAP) process and key questions to be addressed under each step**

Steps Key Questions	Steps Key Questions
<b>C. Implementation Strategies</b>	
1. Prioritizing climate change adaptation in national planning	<ul style="list-style-type: none"> <li>• How can adaptation work best be prioritized for implementation at the national level considering development needs, climate vulnerabilities and risks as well as existing plans?</li> <li>• What criteria can be used to define priority actions?</li> </ul>
2. Developing a (long-term) national adaptation implementation strategy	<ul style="list-style-type: none"> <li>• What is the most appropriate strategy for the implementation of adaptation activities including timing, target areas/beneficiaries, responsible authorities and sequencing of activities?</li> <li>• How can the implementation build on and complement existing adaptation activities?</li> <li>• What are the potential costs of implementing the NAPs and how can these costs be met?</li> </ul>
3. Enhancing capacity for planning and implementing adaptation	<ul style="list-style-type: none"> <li>• How can technical and institutional capacities and regulations for long-term planning and implementation of adaptation be maintained and enhanced at different levels?</li> <li>• What can be learned from other international experiences and international cooperation on adaptation planning?</li> </ul>

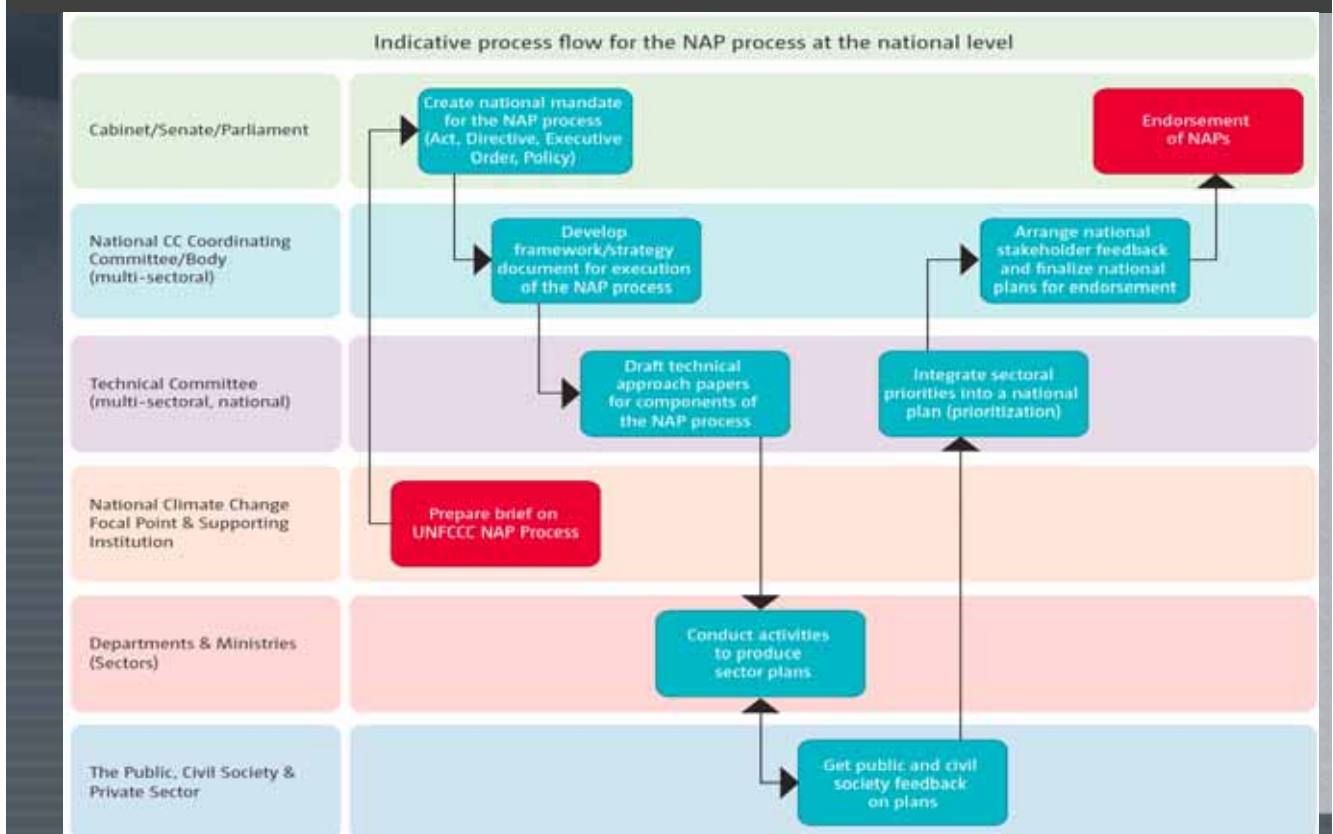
**Table 2. Main elements and steps of the National Adaptation Plan (NAP) process and key questions to be addressed under each step**

Steps Key Questions	Steps Key Questions
<b>C. Implementation Strategies</b>	
4. Promoting coordination and synergy at the regional level and with other multilateral environmental agreements	<ul style="list-style-type: none"> <li>• How can the cross-sectoral and regional coordination of adaptation planning be promoted and enhanced?</li> <li>• How can synergy with other multilateral environmental agreements in the planning and implementation process be identified and promoted?</li> </ul>
<b>D. Reporting, Monitoring and Review</b>	
1. Monitoring the NAP process	<ul style="list-style-type: none"> <li>• Which areas of the NAP process are key for its effectiveness and should thus be the focus of the monitoring process?</li> <li>• What information and metrics are needed to monitor progress, effectiveness, gaps and lessons of the NAP process?</li> </ul>
2. Reviewing the NAP process to assess progress, effectiveness and gaps	<ul style="list-style-type: none"> <li>• What will be the time interval for reviewing the NAP process?</li> <li>• How would progress, effectiveness and gaps best be quantified and assessed and which information from outside of the NAP process is required?</li> </ul>

**Table 2. Main elements and steps of the National Adaptation Plan (NAP) process and key questions to be addressed under each step**

Steps	Key Questions	Steps	Key Questions
<b>D. Reporting, Monitoring and Review</b>			
3. Iteratively updating the national adaptation plans	<ul style="list-style-type: none"> <li>• What are the frequency and/or triggers for an update of the NAPs and related outputs?</li> <li>• Which of the previous steps of the NAP process would be repeated in order to produce an update of the NAPs?</li> <li>• How can the updating of the NAPs be aligned with other development planning processes to ensure harmonization and the identification of co-benefits?</li> </ul>		
4. Outreach on the NAP process and reporting on progress and effectiveness	<ul style="list-style-type: none"> <li>• How can NAP documents best be disseminated to the UNFCCC secretariat and other stakeholders?</li> <li>• What kind of information needs to be included in reporting on progress and effectiveness of the NAP process in national communications?</li> <li>• What other channels can be used to report on progress to the COP and other stakeholders?</li> </ul>		

**Figure 2 - Possible flow of responsibilities for a national adaptation plan process until the endorsement stage**





# Thailand Climate Change Research Strategy (2013-2017)

1. Modelling and assessment of **changing patterns of climate and environmental conditions** in Thailand
2. Research into climate change and **agriculture/food security**
3. Research into climate change and **ecosystems** dynamics and resilience



4. Assessment of the impacts of climate change on **water resources** and options for the improvement of water management systems
5. Research into **climate change and health**
6. Research into the impact of climate change on **urban development**



## 7. Research into Climate Change Adaptation

### 7.1 Research into **autonomous adaptation** at the community level

- ➡ Research into **resilience and vulnerability**, especially into the nature of risks and the ability to cope with risks at the community level.
- ➡ This should include a focus on **action research**, working with local communities and civil society/NGOs.



- Research into **policy and institutional processes** that either encourage or discourage autonomous adaptation responses at the community level.
- The **economic analysis** of local level adaptation processes and intervention options is essential, including the **valuation** of livelihood systems and ecosystem services.
- **Geographical variations** in adaptation needs and opportunities and the nature of autonomous adaptation responses in different parts of Thailand.





## 7.2 Assessment of planned responses to climate change adaptation and mitigation needs including the following issues:

- ⇒ **Climate-proofing** of infrastructure and resource management systems is an important area where a sustained research effort is needed.
- ⇒ The development of **climate readiness**, how organizations change their operational systems to take account of possible climate change impacts.



- ⇒ **Mainstreaming** of adaptation into sectoral policy and planning processes, including the analysis of needs to change in the policy and planning systems of key sectors.
- ⇒ **Economic analysis** of possible planned responses to climate change in relation to their economic viability. This includes the full **valuation** of non-market goods and activities and the assessment of **financial mechanisms**.



8. Research into **mitigation** options for Thailand

9. Research into **knowledge management** associated with climate change



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