



SUBMISSION BY GERMANY ON BEHALF OF THE EUROPEAN COMMUNITY AND ITS MEMBER STATES

**Subject: Nairobi Work Programme on impacts, vulnerability, and adaptation to climate change
Information on approaches, strategies, practices and technologies for adaptation**

1. Introduction

Under para 44 of the Nairobi Work Programme (document FCCC/SBSTA/2006/L26), the Subsidiary Body for Scientific and Technological Advice (SBSTA) invited Parties and other relevant organizations to provide structured submissions, by 15 May 2007, on adaptation approaches, strategies, practices and technologies for adaptation at the regional, national and local levels in different sectors, as well as on experiences, needs and concerns

The EU is taking this opportunity to respond to this request.

2. Adaptation approaches, strategies, practices and technologies in the EU

2.1 General remarks

The EU endorses the Nairobi Work Programme to collect information on approaches, strategies, practices and technologies for adaptation. As the Fourth Assessment Report of the IPCC shows, both developed and developing countries are affected by climate change. Since the publications of the Third Assessment Report, there has been a significant improvement in the understanding of climate impacts and adaptation needs. The European Union anticipates a growing demand for systematic approaches, strategies, practices and technologies for adaptation all over the world.

The EU aims to facilitate access to information on such approaches, strategies, practices and technologies. EU Member States (MS) therefore took the opportunity to list own experience with these issues. The EU suggests having the information of the submissions compiled in an updateable and user friendly way. The EU puts emphasis on the deepening of existing cooperation and the initiation of new cooperation with developing countries based on this submission.

2.2 Spreadsheet responses by Member States (MS)

In preparation for this submission, the German Presidency asked EU MS to provide information on approaches, strategies, practices and technologies for adaptation. The secretariat developed the structure for these submissions and disseminated it to Parties by 20 January 2007 (FCCC/SBSTA/2006/11, paragraph 56).

Ten MS and the European Commission responded: Finland, France, Germany, Italy, Latvia, the Netherlands, Portugal, Spain, Sweden and the United Kingdom. The German Presidency added further contributions from other MS in relation to the Water-Conference¹ and the Report by the European Environment Agency². The German Presidency collected all contributions into one document. See Annex A.

Further information on activities on national level in MS, such as National Adaptation Strategies and specific vulnerabilities, are in the extended country report prepared under the CIRCLE project³.

The preparation of information on EU level activities for this submission was supported by the European Environment Agency's Topic Centre for Air and Climate Change.

¹ <http://www.climate-water-adaptation-berlin2007.org/>

² http://reports.eea.europa.eu/technical_report_2007_2/en

³ http://www.circle-era.net/uploads/media/CIRCLE_Del_Ia1_Extended_Country_Report_1stISSUE_Final_DRAF_.pdf

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Type of adaptation action	Title of adaptation action, including projects	Status of adaptation action - ongoing - under implementation - under development - under consideration	Needs in order to successfully implement the adaptation action	Concerns / barriers	Experiences / lessons learned	References i.e. publications, websites etc.
Austria						
Scope of adaptation action: national level						
Approaches / strategies	FloodRisk - integrated flood risk management within model river catchments (e.g., Danube and its alpine tributaries)	ongoing				
	StartClim - extended on a year-to-year basis, with different scientific foci. StartClim 2003 was about extreme weather events and their impacts on Austria. StartClim 2004 focused on heat waves and drought as well as their impacts on Austria, while the focus now in 2005 and 2006 is on health impacts and impacts on Austria's most vulnerable economies, e.g. tourism.	ongoing				
Practices						
Technologies						

Type of adaptation action	Title of adaptation action, including projects	Status of adaptation action - ongoing - under implementation - under development - under consideration	Needs in order to successfully implement the adaptation action	Concerns / barriers	Experiences / lessons learned	References i.e. publications, websites etc.
Source: Water-Conference & EEA Questionnaire						
Sectoral level						
Sector: agriculture						
Approaches / strategies	Change of cropping patterns and agricultural management strategies	under development	Field tests and modelling with regard to new species, cultivars, tillage methods under modified environmental conditions	Little experience with crop species outside of their usual area of dispersion	High economic risk for innovative farmers	Pritchard, S.G. and J.S. Amthor: Crops and Environmental Change. Food Products Press, New York, 2005.
Practices	Focus on water-saving or more efficient irrigation techniques	under development	Overview / mapping of (ground)water resources available for irrigation	Decrease in new formation of groundwater will constrain the irrigation possibilities	Rising energy costs determine the profitability of irrigation	Stock, M. (ed.): KLARA - Klimawandel - Auswirkungen, Risiken, Anpassung. Potsdam-Institut für Klimafolgenforschung, 2005.
Technologies	Development of new cultivars with extended growth periods; multi-stress resistance; improved water use-efficiency	under development	Breeding for heat or chilling tolerance; stress tolerance as a screening parameter;	Prohibition of genetic modification of crop plants retards progress	Crops will face a wider variability in weather conditions - broad-range tolerance will be more important than optimal tolerance to one stressor	Schimel, D.: Climate Change and Crop Yields: Beyond Cassandra. Science 312, 1889-1890, 2006.

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Belgium						
Scope of adaptation action: regional (sub-national) level						
Approaches / strategies	Walloon: Ban on construction in flood risk areas	ongoing				Report on Demonstrable Progress under the Kyoto Protocol. Available at http://unfccc.int/essential_background/library/items/3599.php?such=j&symbol=/DPR .
	Brussels: Subsidies for using rain water in homes	ongoing				
	Coastal areas: Sigma Plan for flood protection and control (incl. new controlled flooding zones and assuming SLR of 60cm)	under implementation				
	Veilige Kunst (Flanders): coastal management	under implementation				
Practices	Brussels: Rehabilitation of rivers for water retention and improvement of ground infiltration	ongoing				
	Brussels: Building of new storm water basins	under development				

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	to reduce flood risks.					
Technologies						
Source: Water-Conference & EEA Questionnaire						

Cyprus						
Scope of adaptation action:						
<i>national level</i>						
Cyprus						Charalambous, Bambo. Desalination Developments in Cyprus. Watermark, the newsletter of the Middle East Desalination Center, issue 13, August 2001.
Approaches / strategies	Adaption strategies to combat water shortage: - Increased use of treated and desalinated water - Introduction of severe water restrictions on domestic and agriculture water supplies (treated sewage effluent accounts now for 72% of water supply)	ongoing				

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	and is mainly used for agriculture, desalinated water mainly used for domestic purposes) - Implementation of irrigation programs according to crop irrigation needs					
Practices						
Technologies	- Construction of desalination plants - New and improved irrigation systems	ongoing				

Source: Water-Conference & EEA Questionnaire

EU-Commission						
<i>Sectoral level</i>						
Sector: agriculture						
Approaches / strategies	Thematic Strategy for Soil Protection (COM(2006)231 and proposal for a Soil Framework Directive (COM(2006)232)	Under development (the legislative proposal is currently being discussed in the Council and the EP. The expected adoption date is in 2009)	Concerns about rising atmospheric CO2 levels have prompted considerable interest in recent years regarding the fate of the soil carbon pool. The world's soils are estimated to contain 1500 Gt of soil organic carbon, roughly double	There is a need to identify the best soil management practices from an environmental, social and economic viewpoint that will allow a quick uptake by land users (mainly farmers). Research here plays a key role, not only from a purely	Carbon sequestration in agricultural soils by some land management practices can contribute to mitigating climate change. The European Climate Change Programme (ECCP) Working Group on Sinks Related to Agricultural Soils	For general information: http://ec.europa.eu/environment/soil/index.htm . Specific information on adaptation to climate change for soil can be found in the Soil Atlas for Europe. The UK research mentioned can be found in: P. H.

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			the amount of C in the atmosphere. Recent scientific findings (Bellamy et al, 2005) point in the direction of increasing SOC losses from European soils (in the UK an average of 0.6% per year in the period 1978-2003 for a total loss of 15% SOC within 25 years). It is therefore necessary to implement appropriate soil management practices that will minimise carbon losses, thereby maintaining organic matter in soil to such a level as to keep soil fertility and preserve soil functions.	scientific/technical development aspect, but also considering broader societal aspects and market instruments. A particular concern that needs to be addressed is how to support the uptake of adaptation measures that offer advantages from both the climate change and soil protection angles. Indeed, there are trade-offs between different measures that need to be considered in a balanced approach to climate change adaptation.	estimated this potential at equivalent to 1.5 to 1.7% of the EU's anthropogenic CO2 emissions during the first commitment period under the Kyoto Protocol, which is not negligible considering the 8% overall reduction target subscribed to by the EU.	Bellamy, P. J. Loveland, R. I. Bradley, R. M. Lark, G. J.D. Kirk, 2005. Carbon losses from all soils across England and Wales 1978-2003. Nature 437:245-248.
Sector: water resources						
Approaches / strategies	Effectiveness of adaptation and mitigation measures related to changes of the hydrological cycle and its extremes - Quantify the efficiency (cost and benefits) of current and novel	under consideration - call for projects under the FP7				

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	adaptation and mitigation measures related to changes of the hydrological cycle and its extremes in Europe. Analysis of the social and economic implications. Develop (adaptive) management strategies (including considerations on resilience and mitigation measures) for risks caused by long term changes of the hydrological cycle taking into account economic and social pressures (e.g. population and GDP growth, land use) under current and future climate conditions.					
Sector: Forestry						
Approaches / strategies	EU Forest Action Plan (COM(2006)302) Key Action 6 addresses climate change issues related to forests, including adaptation. For the Community-level, it stipulates : "The Commission will	The action plan has been adopted. Implementation is on-going.	Adaptation needs in forests will have to be kept on the research agenda. Long-term systematic monitoring networks are particularly useful to trace impacts of climate change and to	The long life cycle of forest species makes it necessary to plan for a long time ahead.	Carbon sequestration in agricultural soils by some land management practices can contribute to mitigating climate change. The European Climate Change Programme (ECCP) Working Group on	For general information: http://ec.europa.eu/environment/soil/index.htm . Specific information on adaptation to climate change for soil can be found in the Soil Atlas for Europe. The

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	continue to support research, training and studies on the impact of and adaptation to climate change." Other activities are to be carried out by Member States.		develop appropriate adaptation measures.		Sinks Related to Agricultural Soils estimated this potential at equivalent to 1.5 to 1.7% of the EU's anthropogenic CO2 emissions during the first commitment period under the Kyoto Protocol, which is not negligible considering the 8% overall reduction target subscribed to by the EU.	UK research mentioned can be found in: P. H. Bellamy, P. J. Loveland, R. I. Bradley, R. M. Lark, G. J.D. Kirk, 2005. Carbon losses from all soils across England and Wales 1978-2003. Nature 437:245-248.
Sector: biodiversity, environment						
Approaches / strategies	Impacts and feed-backs of climate policies on land use and ecosystems in Europe - Research to assess the impacts of climate (and other sectoral) policies on land use and ecosystems and the resulting feed-back on the climate system. Regional climate models should be coupled with land use models to improve the representation of explicit biophysical and	under consideration - call for projects under FP7				

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	<p>economic mitigation and adaptation strategies in agriculture and forestry. Improved methodologies should include explicit crop/trees growth models with sufficient, sub-national spatial detail to estimate the responses and adaptation possibilities of crops and trees to scenarios of extreme climate events and changes in weather patterns. Models to include scenarios for the distribution and pressures from socio-economic drivers with sufficient geographical details. Impacts of climate mitigation measures need to be covered with sufficient details on bioenergy sources and pathways. Research should help assess and evaluate the impacts of alternative policy scenarios and estimating the associated costs and</p>					

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	benefits of the policies.					
Cross cutting activities						
Approaches / strategies	The core objectives proposed by the ADAM (ADaptation And Mitigation) Consortium are: • assess the extent to which existing and evolving EU (and world) mitigation and adaptation policies can achieve a tolerable transition to a world with a global climate within 2°C above pre-industrial levels, and identify the associated costs and effectiveness, (inc. assessment of damages avoided compared to a scenario where climate change continues unchecked to 5°C). • develop and appraise a portfolio of longer term strategic policy options to address identified shortfalls both between existing mitigation policies and the achievement of the	under development (project funded under the FP6)		•time-scales involved between policy implementation and desired outcome are much longer than in other policy areas; • many areas of policy planning need simultaneously to be addressed, therefore placing a greater demand on the integration of policy across different realms; • the opportunities that climate change opens up for technological innovation and comparative economic advantage for first-mover regions, whilst considerable, are not inevitable; • the truly global nature of the problem requires national or regional policies to be designed within some framework of global strategy	Collaboration with 3rd Country partners (in India and China) to ensure that research is grounded in a global perspective, is ensuring that both benefit from and inform non-Annex I insights and positions.	

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	<p>EU's 2°C target, and between existing adaptation policy development and implied EU goals and targets for adaptation.</p> <ul style="list-style-type: none"> • develop a novel Policy-options Appraisal Framework and apply it both to existing and evolving policies, and to new, long-term strategic policy options, so as to inform: European and international climate protection strategy in post-2012 Kyoto negotiations, a restructuring of International Development Assistance, the EU electricity sector and regional spatial planning. 					
	<p>European Climate Change Programme - The European Commission is exploring options to improve Europe's resilience to climate impacts an, including</p>	<p>Under development</p>	<p>The ECCP relies on the latest scientific findings to support adaptation proposals, thus depends on a close partnership with the scientific community in Europe, the EEA</p>	<p>ensuring the full engagement of all sectors in a multi-layered cross-sectoral participation of stakeholders</p>		<p>general information can be found on: http://ec.europa.eu/environment/climat/eccp_impacts.htm</p>

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	<p>means to adapt to the impacts of unavoidable climate change and how best to assist local, regional and national efforts. The main objective of the ECCP work on adaptation is to define the European Union role in climate change adaptation, through an intensive stakeholder's engagement process to consider the following sectors:</p> <ul style="list-style-type: none"> • Impacts on water cycle and water resources management and prediction of extreme events; • Marine resources and coastal zones and tourism; • Human health; • Agriculture and forestry; • Biodiversity; • Regional planning, built environment, public and energy infrastructure, Structural funds; • Urban planning and 		and the EC funded research programmes.			

Type of adaptation action	Title of adaptation action, including projects	Status of adaptation action - ongoing - under implementation - under development - under consideration	Needs in order to successfully implement the adaptation action	Concerns / barriers	Experiences / lessons learned	References i.e. publications, websites etc.
	construction; • Development cooperation; • Role of insurance industry; • Building national strategies for adaptation (country reports)					
	Full costs of climate change - Quantification of damage, adaptation and mitigation costs for global emission scenarios including those that stabilize atmospheric concentrations covering countries important in international climate negotiations. This includes a coherent, up-to-date representation of socio-economic drivers. Emissions of reactive gases and, air pollutants as well as changes in land cover must be considered. Mitigation costs are to reflect (induced) technological change	under consideration - call for projects under the FP7				

Type of adaptation action	Title of adaptation action, including projects	Status of adaptation action - ongoing - under implementation - under development - under consideration	Needs in order to successfully implement the adaptation action	Concerns / barriers	Experiences / lessons learned	References i.e. publications, websites etc.
	<p>and need to include non CO2 greenhouse gases and sinks and consider recent abatement technologies. Emphasis should be on better estimates for damage and adaptation costs. Damage estimates are to include market damage, non-market damage, catastrophic events and damage related to changes in air-quality (co-benefits). Damage needs to be expressed in physical terms and, to the extent possible, monetary terms and needs to cover all relevant sectors. Explicit treatment of uncertainty is essential. Energy aspects need to be covered. The participation of international partners is encouraged.</p>					

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Ministry of Agriculture and Forestry of Finland. Finland's National Strategy for Adaptation to Climate Change. 2005						
Finland						
Scope of adaptation action:						
<i>national level</i>						
Approaches / strategies	National Strategy for Adaptation to Climate Change: - adaptation measures identified as immediate (2005-2010), short-term (2010-2030) and long-term (2030-2080) - immediate: planning of water services, surveying of risk sites, preparation of general plans for risk sites, construction of irrigation systems for agriculture - short-term: improve preparation for exceptional situations and regional co-operation, increase discharge capacity of dams, improve dam safety and re-	ongoing				

Type of adaptation action	Title of adaptation action, including projects	Status of adaptation action - ongoing - under implementation - under development - under consideration	Needs in order to successfully implement the adaptation action	Concerns / barriers	Experiences / lessons learned	References i.e. publications, websites etc.
	evaluate design discharges at major dams, restrictions on water use - long-term: adapt national plans to climate change effects and improve climate forecasting					
	Environmental Impact Assessment of National Climate and Energy Strategy: check, how well current policies work and whether future measures are still applicable	ongoing				
Practices						
Technologies						
Source: Water-Conference & EEA Questionnaire						
Approaches / strategies	National Strategy for Adaptation to Climate Change: A comprehensive strategy. Aim: increasing national adaptive capacity, Key issue: mainstreaming adaptation. Covers 18 sectors and cross-sectoral issues.	ongoing	Need to carry out the necessary analytical stages in order to identify proper action Need to learn from current weather-related phenomena in different sectors; case studies are useful		Interministerial cooperation is most useful also for implementation purposes. Strong backing from research is useful, and on-going science-policy interface is needed for implementation.	www.mmm.fi/ISTO

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	Impacts described, adaptation measures identified as immediate (2005-2010), short-term (2010-2030) and long-term (2030-2080)				Mainstreaming can be facilitated by development of risk assessment tools.	
Sectoral level						
Sector: Forestry						
Forestry	Mainstreaming adaptation into national forest policy. Both current weather related concerns (e.g. preparedness to deal with storms) and future risks of forest ecosystems and forestry are considered.	on-going				
Sector: Water						
Water	- immediate and short term: surveying of risk sites, preparation of general plans improving preparation for exceptional	- ongoing			Involvement of stakeholders in the analytical phase is useful	

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	situations, improving dam safety and re-evaluation of design discharges at major dams, - long-term: adapt national plans to climate change effects and improve climate forecasting					
Sector: Transport						
Transport	Case studies are used to assess climate impacts to transport in current climate. These, together with assessments including climate change impacts can be used for adaptation planning both now and in the longer run.	Road transport; case study completed and Rail, sea and air transport – case studies planned.			Involvement of stakeholders in the analytical phase is useful	
Sector: Biodiversity, spatial planning, buildings, waste management						
Biodiversity, spatial planning, buildings, waste management	Ministry of the Environment is preparing an adaptation program for the environmental administration. The work is based on the adaptation strategy. It includes biodiversity,	under preparation			A systematic approach within the environment administration is facilitating a thorough adaptation planning	

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	spatial planning, waste management, built environment					
Sector: cross-sectoral issues						
Research programme on adaptation	The aim of the five-year research programme is to support the implementation of the National Adaptation Strategy. Fifteen projects in forestry, agriculture, spatial planning, built environment, floods, drought and biodiversity were started in 2006	on-going				www.mmm.fi/ISTO
France						
Scope of adaptation action						
regional level						
Approaches / strategies	Adaptation plan within the climate plan of Rhône-Alpes Region	Under development	Approval by the regional parliament	Lack of available tools for effective implementation	Process has only recently been implemented, so too early to comment.	
	Adaptation plan within the climate plan of Réunion region	Under implementation	Approval by the regional parliament	Lack of available tools for effective implementation	Process has only recently been implemented, so too early to comment.	

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	Adaptation plan within the climate plan of Martinique Département	Under consideration	Approval by the general council	Lack of available tools for effective implementation	Process has only recently been implemented, so too early to comment.	
Practices						
Technologies						
<i>national level</i>						
Approaches / strategies	National observatory on climate change impacts (ONERC): collects information from research and informs policy makers (including local communities) on impacts, vulnerability and adaptation	Ongoing since 2002				http://onerc.gouv.fr
	National adaptation strategy	Ongoing	Implementation of strategy recommendations, within the framework of an Adaptation plan		Process has only recently been implemented, so too early to comment.	http://onerc.gouv.fr
	National adaptation plan	Under development	Completion of cross-sectoral and regional negotiations		Process has only recently been implemented, so too early to comment.	http://onerc.gouv.fr
	Research program GICC (Management and impacts of climate change) of Ministry of ecology and sustainable development	ongoing since 1999				http://medias.obs-mip.fr/GICC/

Type of adaptation action	Title of adaptation action, including projects	Status of adaptation action - ongoing - under implementation - under development - under consideration	Needs in order to successfully implement the adaptation action	Concerns / barriers	Experiences / lessons learned	References i.e. publications, websites etc.
	Assessment of costs of impacts and adaptation at national level	Under development	Development of a database and of consistent approaches among sectors and regions			
Practices	National heat wave plan from Ministry of Health "Plan canicule"	Ongoing			Large reduction in casualties during heatwaves	www.sante.gouv.fr
Technologies						
local (community) level						
Approaches / strategies	City of Paris climate plan	Under development				http://www.paris.fr
Practices						
Technologies						
Sectoral level						
Sector: agriculture						
Approaches / strategies						
Practices						
Technologies						
Sector: water resources						
Approaches / strategies	Scientific studies of climate change impacts on the Rhône and Seine rivers	completed				http://medias.obs-mip.fr/GICC/
Practices						
Technologies						

Type of adaptation action	Title of adaptation action, including projects	Status of adaptation action - ongoing - under implementation - under development - under consideration	Needs in order to successfully implement the adaptation action	Concerns / barriers	Experiences / lessons learned	References i.e. publications, websites etc.
Sector: health						
Approaches / strategies	Heat wave plan	Ongoing	Centralised organisation by the Ministry of Health and social affairs, with excellent cooperation between organisations from different ministries and local governments.			www.sante.gouv.fr
Practices	Improved coordination between the services of the central and local governments	Ongoing		Lack of cross-sectoral cooperation	This plan has been implemented after the 2003 heatwave which caused 15,000 casualties in France. This plan already helped to save many lives during another strong heatwave which occurred in July 2006.	
Technologies	Improved weather prediction and information, tailored to the needs of the health system in heat waves situations	Ongoing	Sufficiently reliable local weather prediction			
Approaches / strategies	Creation of a research centre on emerging diseases in La Réunion	Ongoing	Finance	Cooperation between different fields of science, lack of specialists in many fields such as entomology and biodiversity		

Type of adaptation action	Title of adaptation action, including projects	Status of adaptation action - ongoing - under implementation - under development - under consideration	Needs in order to successfully implement the adaptation action	Concerns / barriers	Experiences / lessons learned	References i.e. publications, websites etc.
Practices						
Technologies	Epidemiology, medical research, links with biodiversity, entomology etc					
Sector: coastal zones (settlements)						
Approaches / strategies						
Practices						
Technologies						
Sector: biodiversity, environment						
Approaches / strategies						
Practices						
Technologies						
Sector: transport, built-environment						
Approaches / strategies						
Practices						
Technologies						
Energy production						
Approaches / strategies						
Practices						
Technologies						

Type of adaptation action	Title of adaptation action, including projects	Status of adaptation action - ongoing - under implementation - under development - under consideration	Needs in order to successfully implement the adaptation action	Concerns / barriers	Experiences / lessons learned	References i.e. publications, websites etc.
Germany						
Scope of adaptation action:						
<i>national level</i>						
Approaches / strategies	KomPass - "Competence centre" on climate change impacts and adaptation	ongoing	collection of data and information on climate change impacts and adaptation, making it available to decision-makers and the public, support information exchange and networking among relevant stakeholders			See the Federal Environment Agency's website at http://www.anpassung.net
	National Adaptation Strategy	under development				
	National Strategy on Integrated Coastal Zone Management (ICZM)	ongoing	ICZM is an management approach, trying to reduce conflicts on the development of coastal areas, to maintain eco-quality and to orientate on a sustainable development approach			http://www.ikzm-strategie.de/
	IPCC coordination office	ongoing	coordination office for Germany's part on the IPCC process			www.de-ipcc.de
	KLIMZUG	under implementation	KLIMZUG has just been announced and will be a funding programme dealing	programme has just been announced	aspect of partner regions may play a leading role in possible training opportunities,	

Type of adaptation action	Title of adaptation action, including projects	Status of adaptation action - ongoing - under implementation - under development - under consideration	Needs in order to successfully implement the adaptation action	Concerns / barriers	Experiences / lessons learned	References i.e. publications, websites etc.
			with the regional aspect on adaptation to climate change. The goal is to create regional networks in Germany and use joint forces to deal with climate change. In addition, networks in Germany shall find partner regions worldwide to share knowledge and profit from one another.		but since KLIMZUG has just been announced no concrete information can be given at this time	
regional (sub-national) level						
Approaches / strategies	Klimastudie Brandenburg (Brandenburg)	ongoing	Guideline about support for the improvement in the landscape water balance. Furthermore the study points on impacts of moderate climate change on semi-natural ecosystems, managed forests, agricultural yields and other economic aspects.			http://www.mluv.brandenburg.de/cms/detail.php/lbm1.c.212281.de http://www.mluv.brandenburg.de/cms/media.php/2328/kstudi03.pdf http://www.mluv.brandenburg.de/cms/media.php/2320/fb_i104.pdf
	INKLIM (Hesse)	ongoing	Second module of INKLIM (climate change and climate impacts) deals with the assessment of present			http://www.hmuly.hessen.de/irj/HMULV_Internet?cid=5ec6add988184f55cc1af07c8e8b96bd

Type of adaptation action	Title of adaptation action, including projects	Status of adaptation action - ongoing - under implementation - under development - under consideration	Needs in order to successfully implement the adaptation action	Concerns / barriers	Experiences / lessons learned	References i.e. publications, websites etc.
			climate change and climate projections till 2012. Climate impacts includes possible adaptation measures in different sectors (water resources management, agriculture and forestry, biodiversity and human health)			http://www.hlug.de/medien/luft/inklim/index.htm http://www.hlug.de/medien/luft/inklim/dokumente/abschlussbericht_I1.pdf
	KLIWA (Bavaria, Baden-Wuerttemberg)	ongoing	investigations concerning climate change and its impacts on water resources management			http://www.kliwa.de/ http://www.kliwa.de/download/KLIWA.pdf http://www.kliwa.de/index.php?pos=ergebnisse/hefte/
	KLARA (Baden-Wuerttemberg)	finished	KLARA assesses the climate impacts where BW is most vulnerable. This includes water, agriculture, forestry, nature conservation, air quality, economy, infrastructure and urban planning			http://www.lubw.baden-wuerttemberg.de/servlet/is/14503/ http://www.lubw.baden-wuerttemberg.de/servlet/is/1454/
	ESPACE (European Spatial Planning: Adapting to Climate Events)	ongoing	raises awareness of decision-makers, experts and the public to the problems of climate change in the river Main area. Development of adaptation strategies,			

Type of adaptation action	Title of adaptation action, including projects	Status of adaptation action - ongoing - under implementation - under development - under consideration	Needs in order to successfully implement the adaptation action	Concerns / barriers	Experiences / lessons learned	References i.e. publications, websites etc.
			e.g. case study of Bavarian Environment Agency in “Fränkische Saale” on water resources management with the focus on flood protection adapted to climate change.			
Sectoral level						
Sector: water resources						
Approaches / strategies	KLIWA (Bavaria, Baden-Wuerttemberg)	ongoing	investigations concerning climate change and its impacts on water resources management			http://www.kliwa.de/ http://www.kliwa.de/download/KLIWA.pdf http://www.kliwa.de/index.php?pos=ergebnisse/hefte/
	ESPACE (European Spatial Planning: Adapting to Climate Events)	ongoing	raises awareness of decision-makers, experts and the public to the problems of climate change in the river Main area. Development of adaptation strategies, e.g. case study of Bavarian Environment Agency in “Fränkische Saale” on water resources management with the focus on flood protection adapted to climate change.			

Type of adaptation action	Title of adaptation action, including projects	Status of adaptation action - ongoing - under implementation - under development - under consideration	Needs in order to successfully implement the adaptation action	Concerns / barriers	Experiences / lessons learned	References i.e. publications, websites etc.
Sector: coastal zones (settlements)						
Approaches / strategies	Integrated Coastal Defence Management (Schleswig-Holstein)	update	Safeguarding coastal lowlands and irreversible land loss (coastal erosion)			http://www.ikzm-strategie.de/schleswig-holstein.php
	Regional Planning Concept (Lower Saxony)	update	ICZM is an management approach, trying to reduce conflicts on the development of coastal areas, to maintain eco-quality and to orientate on a sustainable development approach			http://www.ikzm-strategie.de/niedersachsen.php
Sector: biodiversity, environment						
Practices	Development of an ecological network system consisting of core areas, connecting areas and connecting elements	Under development	Concepts have to be developed at various spatial scales, taking landscape characteristics and development potentials into account. There are still remaining research needs on the efficacy of various forms of networks for facilitating migration and distribution of species.	Ecological networks can mitigate the impacts of climate change on biodiversity only to a limited extent, because not all species are able to shift their distribution by using the habitat structures provided. Also, ecological networks cannot prevent threats to species and populations in cases where their potential distribution area significantly declines or even		http://www.bfn.de/0311_biotopverbund.html http://www.bfn.de/0308_gebietsschutz.html

Type of adaptation action	Title of adaptation action, including projects	Status of adaptation action - ongoing - under implementation - under development - under consideration	Needs in order to successfully implement the adaptation action	Concerns / barriers	Experiences / lessons learned	References i.e. publications, websites etc.
				disappears as a consequence of climate change.		
Cross cutting activities						
Approaches / strategies	Klimastudie Brandenburg (Brandenburg)	ongoing	Guideline about support for the improvement in the landscape water balance. Furthermore the study points on impacts of moderate climate change on semi-natural ecosystems, managed forests, agricultural yields and other economic aspects.			http://www.mluv.brandenburg.de/cms/detail.php/lbm1.c.212281.de http://www.mluv.brandenburg.de/cms/media.php/2328/kstudi03.pdf http://www.mluv.brandenburg.de/cms/media.php/2320/fb_i104.pdf
	INKLIM (Hesse)	ongoing	Second module of INKLIM (climate change and climate impacts) deals with the assessment of present climate change and climate projections till 2012. Climate impacts includes possible adaptation measures in different sectors (water resources management, agriculture and forestry, biodiversity and human health)			http://www.hm.ulv.hessen.de/irj/HMULV_Internet?cid=5ec6add988184f55cc1af07c8e8b96bd http://www.hlug.de/medien/luft/inklim/index.htm http://www.hlug.de/medien/luft/inklim/dokumente/abschlussbericht_I1.pdf
	KLIWA (Bavaria,	ongoing	investigations			http://www.kliwa.de/

Type of adaptation action	Title of adaptation action, including projects	Status of adaptation action - ongoing - under implementation - under development - under consideration	Needs in order to successfully implement the adaptation action	Concerns / barriers	Experiences / lessons learned	References i.e. publications, websites etc.
	Baden-Wuerttemberg)		concerning climate change and its impacts on water resources management			http://www.kliwa.de/download/KLIWA.pdf http://www.kliwa.de/index.php?pos=ergebnisse/hefte/
	KLARA (Baden-Wuerttemberg)	finished	KLARA assesses the climate impacts where BW is most vulnerable. This includes water, agriculture, forestry, nature conservation, air quality, economy, infrastructure and urban planning			http://www.lubw.baden-wuerttemberg.de/servlet/is/14503/ http://www.lubw.baden-wuerttemberg.de/servlet/is/1454/
	ESPACE (European Spatial Planning: Adapting to Climate Events)	ongoing	raises awareness of decision-makers, experts and the public to the problems of climate change in the river Main area. Development of adaptation strategies, e.g. case study of Bavarian Environment Agency in “Fränkische Saale” on water resources management with the focus on flood protection adapted to climate change.			
Programmes and activities with developing countries						
Sector: agriculture						
Approaches /	Tunisia (national) :	ongoing	• Ensure the multi-		• The diagnosis phase	www.gtz.de/climate

Type of adaptation action	Title of adaptation action, including projects	Status of adaptation action - ongoing - under implementation - under development - under consideration	Needs in order to successfully implement the adaptation action	Concerns / barriers	Experiences / lessons learned	References i.e. publications, websites etc.
strategies	Assistance to the national government developing a national adaptation strategy for the sectors agriculture, water and ecosystems		disciplinarity of experts • Building capacities for modelling work to better determine regional climate change		is important and should create cooperation among experts and institutions. If this phase is not political, but remains scientific, differences will occur. • A major element for success is obtaining a national consensus with regard to guiding images. It is important to inform the institutional knowledge acquired in a sectoral way.	
Approaches / strategies	Vietnam: • Increase productivity of paddy farming for new climate conditions • Expand non-farm economic activities	completed	Public policy for recognizing the importance of climate change in rice research	It requires a lot of time-consuming research and reform of policies and institutions to create convenient conditions for the development process.	Any climate change adaptation options should work broadly within the framework of development strategies, which are consistent with enhancing resilience to society to withstand the anticipated climate change risks. The adaptation options need to be spatially and temporally differentiated considering socio-economic settings, emerging	http://www.gtz.de/de/dokumente/en-climate-adaptation-vietnam.pdf

Type of adaptation action	Title of adaptation action, including projects	Status of adaptation action - ongoing - under implementation - under development - under consideration	Needs in order to successfully implement the adaptation action	Concerns / barriers	Experiences / lessons learned	References i.e. publications, websites etc.
					environmental threats, industrialization, and urbanization trends in various regions. Adaptation options should consider the “medium term” up to 2025, though climate change is likely to pose risks beyond this time horizon. The gradual shifting of economic activity from climate-sensitive agricultural and shrimp/fish culture to the climate-insensitive industry and service sectors is a viable option to minimize risks and conserve natural resources for sustainable development.	
Practices						
Technologies						
Sector: water resources						
Approaches / strategies	India (sectoral) : Integrated watershed management	completed			Participatory Impact Monitoring, Capacity Building and Training ensures sustainability	www.gtz.de/climate
Practices	Northwest Benin (local): Improved	ongoing			Development of "awareness creating"	www.gtz.de/climate

Type of adaptation action	Title of adaptation action, including projects	Status of adaptation action - ongoing - under implementation - under development - under consideration	Needs in order to successfully implement the adaptation action	Concerns / barriers	Experiences / lessons learned	References i.e. publications, websites etc.
	watershed management to enable the rural population to manage the resource water sustainable.				workshop modules directed towards the rural population	
Technologies						
Sector: coastal zones (settlements)						
Approaches / strategies						
Practices	Mekong Delta (Vietnam, Cambodia, Thailand and Laos/regional): Improvement of flood and disaster risk management	completed			The program has an educational component, which is especially directed at women and children as they tend to stay in the high risk areas while the men go off to find work elsewhere.	http://www.gtz.de/en/themen/uebergreifendethemen/krisenpraevention/2913.htm
Practices	Mozambique, Búzi (local): People oriented, inter-district early warning system for the catchment area of the Rio Búzi; participatory risk analysis; establishment of local Disaster Management Committees and integration of climate change topics in the school curricula's	completed			<ul style="list-style-type: none"> • Participatory risk analyses: Identification of one third of the population being disaster-prone; detailed maps depict high-risk areas and elevated grounds for emergency evacuation. • Effective regulations for cyclone-proof buildings • Establishment of Disaster Management Committees/ Early 	http://www.gtz.de/en/themen/umweltinfrastruktur/umweltpolitik/16057.htm

Type of adaptation action	Title of adaptation action, including projects	Status of adaptation action - ongoing - under implementation - under development - under consideration	Needs in order to successfully implement the adaptation action	Concerns / barriers	Experiences / lessons learned	References i.e. publications, websites etc.
					Warning System The people of the Búzi have shown that climate-driven disasters and threats can be effectively met by concentrated, decentralised community action and self-organisation at own cost.	
Technologies						
Cross cutting activities						
Approaches / strategies	Indonesia: Assistance to the national government developing a national adaptation strategy	under development				www.gtz.de/climate
Approaches / strategies	India (sectoral): • Risk assessment and integration into investment planning • Implementation-oriented technical measures for adaptation • Insurance Market Infrastructure • Potentials for policy assessment and development	under development	Risk management tools to help cope with/adapt to climate change impacts through effective integration into major investment planning/programmes; Insurance Market Infrastructure	Integration of adaptation into various sectoral policy decisions		www.gtz.de/climate
Approaches / strategies	Establishment of CEPREDENAC as a	completed			Development of instruments for disaster	http://www.gtz.de/de/dokumente/en-DRM-

Type of adaptation action	Title of adaptation action, including projects	Status of adaptation action - ongoing - under implementation - under development - under consideration	Needs in order to successfully implement the adaptation action	Concerns / barriers	Experiences / lessons learned	References i.e. publications, websites etc.
	regional capacity to facilitate Disaster Risk Management in Central America (regional)				risk management in rural areas of Latin America and the Caribbean	instruments-1.pdf http://www.gtz.de/de/dokumente/en-community-based-drm.pdf
Practices	Nicaragua (local): municipalities of Waspam, Bonanza, Rosita and Santa Teresa: Adaptation to climate change through disaster risk management (risk assessment and improvement of early warning systems)	completed			The most important tool to date has been the carrying out of a series of participatory risk analyses involving 550 citizens from five Miskito communities. These were facilitated by employees from the environmental unit of the municipalities of Bonanza and Santa Teresa, assisted by the local authorities. They had received special training on this new tool, which creates anticipation in order to ensure preparedness. In addition to several workshops in the communities, a contest of drawing local risk-maps was conducted and well received.	http://www.gtz.de/en/themen/umwelt-infrastruktur/umweltpolitik/16057.htm
Technologies	Tajikistan, Zeravshan Valley (local): Establishment of an	ongoing				http://www.gtz.de/en/themen/uebergreifendethemen/krisenpraeventi

Type of adaptation action	Title of adaptation action, including projects	Status of adaptation action - ongoing - under implementation - under development - under consideration	Needs in order to successfully implement the adaptation action	Concerns / barriers	Experiences / lessons learned	References i.e. publications, websites etc.
	early warning system and capacity building for disaster risk management					on/1817.htm

Hungary						
Scope of adaptation action:						
<i>national level</i>						
Approaches / strategies	VAHAVA project: coordination, publication/dissemination, expert debates on climate change issues					
	The New Vásárhelyi Plan: emergency reservoirs along Upstream- and Middle Tisza sections to enhance flood safety. Focus on flood control, conservation and env. protection, ecotourism, agro-ecological farming, rural development.					
Practices						
Technologies						
Source: Water-Conference & EEA Questionnaire						

Type of adaptation action	Title of adaptation action, including projects	Status of adaptation action - ongoing - under implementation - under development - under consideration	Needs in order to successfully implement the adaptation action	Concerns / barriers	Experiences / lessons learned	References i.e. publications, websites etc.
Ireland						
Scope of adaptation action:						
<i>national level</i>						
Approaches / strategies	Inter Basin Water Transfer of water resources from Lough Ree on the Shannon to Dublin City	under consideration				
Practices						
Technologies						
Source: Water-Conference & EEA Questionnaire						

Italy						
Scope of adaptation action:						
<i>Level (National, Regional)</i>						
Approaches / strategies						
Sectoral level						
Sector: Desertification						
Establishment of a National Action Plan (IMELS, Dec. 1999) & a National Committee to Combat Desertification. 10 Regions and 11	Launch in 2006 (through the Operative Plan 2005) of Local Action Plans in 6 Regions including: studies and researches, infrastructures and training and	Status: ongoing Additional info: The plan implementation does not include the allocation of financial resources specifically				Italian Ministry of Environment, Land and Sea (IMELS) – General Direction for Soil defence; National Committee to Combat Desertification “Operative Plan 2005”

<p>Basin Authorities (covering, in total, 87% of the national territory) have presented their programmes to the National Committee to Combat Desertification. Based on these Programmes, priorities (most vulnerable areas and the prevention, mitigation and adaptation strategies) and financial requirements of the National Plan have been identified. The plan implementation does not provide specific financial resources, but it provides them through the relevant sectoral policies.</p>	<p>information activities on several sectors (land protection, sustainable management of water resources, reduction of the stress by productive activities, and restoration of the territorial balance) and further 6 Projects: - Education, training, awareness raising - Training for Regional governments' heads - Dissemination and awareness raising in Italy on the basic knowledge to combat desertification - Monitoring and functional assessment of the interventions of reforestation and olive tree cultivation to combat desertification in Italy - Methodology for the assessment of the economic and environmental damages caused by desertification-related drought events - Preparation of a National thematic GIS for the environmental vulnerability to desertification.</p>	<p>to combat desertification, but it provides it through sectoral policies having an impact on desertification.)</p> <p>Status: ongoing</p> <p>Status: ongoing</p> <p>Status: ongoing</p> <p>Status: ongoing</p> <p>Status: ongoing</p> <p>Status: ongoing</p>				<p>(19 Dec. 2005)</p> <p><i>[Ministero dell'Ambiente e della Tutela del Territorio - Direzione Generale per la Difesa del Suolo, Comitato Nazionale per la Lotta alla Siccità ed alla Desertificazione Piano Operativo 2005 (19 Dic. 2005)]</i></p>
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Sector: Water						
Ordinance on water emergencies	Address water crises, providing both technical and financial emergency measures. Ad hoc organizations for crisis management and management of water resources: - 'Drought control room' for drought events in the Po river basin; - Coordination Unit for the management of water resources shared between the Puglia and Basilicata regions.	ongoing ongoing ongoing				EEA Technical report No 2/2007 "Climate change and water adaptation issues" (Chap. 3.2 Activities in relation to drought and scarcity; 3.2.3 Examples of action, pp 39-40)
Project (Research Programmes with relevance at the National level - PRIN)	DECISION SUPPORT SYSTEMS IN THE MANAGEMENT OF WATER SYSTEMS WITH CONFLICTUAL USES DURING DROUGHTS	Finished (2005-2006)				Project Type: <i>PRIN (Research Programmes with relevance at the National level)</i> Funding Institution: MIUR (Ministry for University and Research)
Sector: Agriculture						
National Plan for irrigation	<i>National Plan for irrigation and specific funds are allocated to alleviate the effects of extreme events (including droughts).</i>	ongoing				EEA Technical report No 2/2007 "Climate change and water adaptation issues" (Annex 1. Country level activities on climate change in relation to water
Rural Development	The Ministry of	ongoing				

Plan	Agriculture and Forests identified quantitative protection and improvement of water resources as a main objective to be tackled at the regional scale. As a consequence, the National Strategic Plan includes specific measures for water quantitative protection especially under the issues: “Improvement of agricultural sector and forestry competitiveness” and “Environmental and rural areas improvement”.					resource issues; A1.16 Italy , pp. 86-87)
Project	<i>CLIMAGRI – CLIMATE CHANGE AND AGRICULTURE</i> <u>Aim:</u> improve the knowledge of linkages between agriculture and climate change <u>Focus:</u> climate change impacts, but in a view to support implementation of response measures, and draw recommendations for adaptation. <u>Subprojects:</u> 1: climatic analysis and future scenarios 2: Italian Agriculture and climate change	Finished : 2001-2004				Funding Institution: Ministry for Agriculture and Forestry Policies (MIPAF) CLIMAGRI (http://www.climagri.it/presentazione.htm)

	3: Drought, desertification and water resources management 4: Data dissemination and communication					
Sector: Human Health						
National Project of the Department for Civil Protection (2004) for the prevention of heat health effects	Establishment of City-specific Heat Health Watch Warning Systems (HHWWS) & a Daily mortality surveillance system.	Ongoing				Proceedings of the Conference “Improving Public Health responses to extreme weather events”, Bonn 21-24 April 2007
Heat Health Prevention National Operative Plan (Ministry of Health and CCM, 2005)	2005 Ministry of Health and <u>Main aims</u> : extending the above systems for preventing heat effects on health over the whole territory; definition of local response plans oriented to classes of the vulnerability registry	Ongoing				Section: “ITALY MINISTRY OF HEALTH /CCM (National Centre for Disease Prevention and Control) - INITIATIVES DEVELOPED IN ITALY FOR HEAT WAVE HEALTH PREVENTION AND FOR SUMMER PREPAREDNESS PLANNING”
Establishment of the National Working group of experts (Ministry of Health, 2004) coordinated by the Operative Director of the Health Prevention	<u>Aim</u> : to provide Local Authorities with the tools to prepare Surveillance and Action Plans to prevent and combat heat wave damage to the health. <u>Outcomes</u> : 2004, Guidelines “for the preparation of surveillance and response plans to	Ongoing				

<p>Project of the Social Guardians Service (Ministry of Health, 2004-2005) in four large cities (Rome, Turin, Milan and Genoa)</p>	<p>combat health effects from anomalous heatwaves”, updated in 200. Since 2006 a larger number of Regions, and municipalities have made similar plans; Preparation of the vulnerability registry.</p> <p><u>Aim:</u> to verify the effectiveness of the assistance model based on “social guardian” figure: a person of support for the elderly living alone or in difficulty and in disadvantaged conditions.</p>	<p>Finished: 2004-2005</p>				
<p>Special website of the Ministry of health and CCM - HEAT LAB, 2004</p>	<p><u>Aim:</u> to facilitate an exchange of knowledge between regions, districts, municipality and health/social workers and all organisations and institutions which work in the area of health prevention and social welfare.</p>	<p>Ongoing</p>				
<p>National Call Centre Service number “fifteen hundred”. National toll-free service active all</p>	<p><u>Aim:</u> to give to the population, advices, recommendations to prevention and</p>	<p>Ongoing</p>				

summer long, every day from 8 a.m to 8 p.m.	information regarding social and health services for the elderly available in all regions.					
Sector: Coastal protection						
Practices/approaches	<p>Channelling and drainage units (almost all the Italian coastal plains with depressed areas)</p> <p>Sand feeding (due to coastal erosion, to rebuild the sand mantle for tourist purposes only).</p> <p>ICZM: Some Italian Regions (e.g. Emilia-Romagna) also have an Integrated Coastal Zone Management Plan which does not tackle directly climate change, but could be beneficial to adapt.</p>					Italian Third National Communication to UNFCCC, 2002
Sector: Alpine area protection						
Ratification of the Convention for the Alps (Salzburg, Nov. 1991)	The framework Convention is aimed at ensuring a global policy for Alps protection and preservation, including consideration of CC.	ongoing				The Alpine Convention (http://www.convenzionedellealpi.org/page1_en.htm)
Project	<i>ClimChAlp - Climate</i>	ongoing: March 2006 -				ClimChAlp

(INTERREG III B ALPINE SPACE PROGRAMME)	<i>Change, Impacts and Adaptation Strategies in the Alpine Space</i> Aim: Assessment of climate change in the Alpine area and of its impacts on natural risks, spatial and economic development & Development of a flexible net of trans-national response, & drawing of Strategic recommendations for adaptation.	March 2008				(http://www.climchalp.org/)
Project (INTERREG III B ALPINE SPACE PROGRAMME)	<i>FORALPS</i> Aim: Meteo-Hydrological Forecast and Observations for improved water resource management in the ALPS	Ongoing: Jan. 2005 – Dec. 2007				FORALPS (http://www.unitn.it/foralps/)

Latvia						
Scope of adaptation action:						
<i>regional level</i>						
Approaches / strategies	HELCOM Convention	Ongoing				Ministry of the Environment: http://www.vidm.gov.lv/eng/
	Project ASTRA - Developing Policies & Adaptation Strategies to Climate Change in the Baltic Sea Region	Ongoing			Cross sectoral and sustainable development approach: strengthening integrated development	ASTRA project: http://www.astra-project.org/cms/; Latvian University Faculty of Geography

	(2005-2007)				of coastal zones, islands and other specific areas; raise awareness of climate change (CC) impacts and adaptation issues; link CC adaptation to spatial planning mechanism; recommend suitable adaptation policies and strategies at national, regional and local levels	and Earth Science: http://www.lu.lv/eng/general/structure/faculties/geography/index.html
Practices						
Technologies	Latvian Environmental Protection Fund financial support to relevant projects	Ongoing				Latvian Environmental Protection Fund: http://www.lvaf.gov.lv/
	Latvian Environmental Investment Fund financial support to relevant projects	Ongoing				Latvian Environmental Investment Fund: http://www.lvif.gov.lv/?object_id=372
national level						
Approaches / strategies	National Security Conception (new version, draft)	Under development	Assess all risks concerning climate change as well as, for example, terrorism, and transpose them in common risk management system		Until now, all natural disasters have been managed by civil protection system, and the nature of them concerns consequences - post factum, not as much prevention policies and measures	Ministry of the Environment: http://www.vdm.gov.lv/eng/ ; Ministry of the Interior: http://www.iem.gov.lv/?lng=en
	National Programme on Prevention Environmental Risks	Under development			There are four planning levels - National, Regional, District and Local planning level in Latvia, each	Ministry of the Environment: http://www.vdm.gov.lv/eng/

					<p>represented by territorial plans in appropriate scale. National Plan determines national interests and requirements for use and development of the whole territory of the country. Plans of five Planning Regions determine development possibilities, trends and restrictions of the territory of these regions. District Plans of twenty six districts determine development possibilities, trends and restrictions of the territory of these districts and design current and define planned (permitted) use of the territory, as well as specifies requirements, territories and objects of higher planning level. Local Plans determines development possibilities, trends and restrictions of the territory and design current and define planned (permitted) land-use, as well as specify requirements,</p>	
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					territories and objects of higher planning level. Detailed Plans specify the requirements of the land-use set by the Local Plan within designed territory	
Practices	Hydrological and meteorological observations	Ongoing			In Latvia, the first hydrological observations in the territory of Latvia date back to the 16th century when the recording of ice moving phenomena on the river Daugava near Riga began in 1530. Observations of the water level in the coastal area of the Baltic Sea started in 1841 in Daugavgriva by applying a water level-meter. Later in 1865, water level observations with a level-meter started also in Liepaja, in 1873- Ventspils and in 1884- Kolka. Hydrological observations, as well as meteorological observations (made by Latvian Environment, Geology and Meteorology Agency) of terrestrial rivers are carried out in 53	

					<p>observation stations located near rivers and reservoirs of Latvia, monitoring water level, flow, water temperature, ice phenomena and ice thickness.</p> <p>Measurements of water level, temperature, salinity, wave and ice phenomena in the Baltic Sea and the Gulf of Riga are carried out in 9 stations. Modern technical equipment, automatic observation sensors and mobile communication devices provide the possibility to receive water level and temperature data in real time regime and perform operative information follow-up and correction of possible inaccuracies.</p>	
	Spatial planning			<p>Necessity regularly updated Latvian hazard and risk maps - the newest ones are dated by 2001 (in State Civil Protection Plan); the better situation is with risk maps in forestry and in the newest strategic environmental assessment reports concerning spatial</p>		

				planning.		
Technologies	Protecting dikes to reduce threatening floods along the Daugava					
	JSC LATVENERGO annual payments for Dagava River bank fortification	Ongoing				
	Latvian Environmental Investment Fund financial support to relevant projects	Ongoing				Latvian Environmental Investment Fund: http://www.lvif.gov.lv/?object_id=372
	Latvian Environmental Protection Fund financial support to relevant projects	Ongoing				Latvian Environmental Protection Fund: http://www.lvaf.gov.lv/
local (community) level						
Approaches / strategies	Management plans for the individual protected nature areas	Under implementation, ongoing		As a result of slow development of land and area reform, a large amount of economically and administrative weak municipalities, unable carried out all their functions, still remain in Latvia	Practically in all plans chapters on risk areas (mainly concerning flood risk) and its management measures are involved	Ministry of the Environment: http://www.vidm.gov.lv/eng/
	Conception on Measures to prevent Flood Risk in Jekabpils Town after Plavini HPP and its Reservoir Construction (2006)	Under implementation				Ministry of the Interior: http://www.iem.gov.lv/?lng=en
	Riga Development Plan for 2006-2018 (2005) - Strategic Environmental	Under implementation				

	Assessment					
Practices	Life-NATURE project "Protection and Management of Coastal Habitats in Latvia" (2002-2005)		The needs to prevent coastal erosion are: enforcement of beach dune belt; reconstruction of land drainage systems; to meet the requirements of regularly state monitoring on geological processes of the sea-coast; to dump the regularly dredged sediments from harbour aquatories and ship route canals in the shallow water belt (0-6m depth)		In Latvia, a total of 45 % of the proposal project territory is in Latvia's legally protected territory system - the Baltic Sea coastal protection belt. The Project area was the entire Baltic Sea coast – an approximately 300 m wide coastal zone beginning from the waterline in the terrestrial direction. In areas where threatened habitats of Community importance (dunes, coastal meadows) continue outside of this belt, project actions extend to cover the entire areas of the habitats. The total surface area of the project was 18,000 ha. Particular attention was devoted to public education. Management plans for the individual protected nature areas were elaborated as the main results of the project.	Protection and Management of Coastal Habitats in Latvia: http://piekraste.daba.lv/EN
Technologies	Protecting dikes to reduce threatening floods along the Daugava	Under implementation, ongoing				Ministry of Economics: http://www.em.gov.lv/em/2nd/?lng=en&cat=3&lng=en

	Latvian Environmental Protection Fund financial support to relevant projects	Ongoing				Latvian Environmental Protection Fund: http://www.lvaf.gov.lv/
	Latvian Environmental Investment Fund financial support to relevant projects	Ongoing				Latvian Environmental Investment Fund: http://www.lvif.gov.lv/?object_id=372

Sectoral level						
Sector: agriculture						
Approaches / strategies	Latvian Rural Development National Strategy Plan 2007-2013 (2006): risk management	Under implementation		Due to insufficient resources – outdated agricultural machinery, buildings and equipment, including that related to environment protection; fragmented production structure competing on the local market. The consequences of the fragmented structure are low productivity in comparison with developed countries and lower than that in other sectors; small proportion of long-term investments (in comparison with short-term); suitability of conditions to agriculture largely vary across the territory; large proportion of undereducated	In Latvia, there is: large land area suitable to agriculture; considerable investment in agricultural production facilities, buildings, machinery and equipment by making use of national and EU support allocated for that purpose; relatively low labour cost; relatively unpolluted environment as a resource available for production of agricultural products; Gross added value in agriculture is growing rapidly; an advisory and education extension system in place to support farmers	Ministry of Agriculture of Republic of Latvia: http://www.zm.gov.lv/?setl=2

				employees in the sector and insufficient knowledge of persons employed in agricultural establishments to establish competitive management systems; large number of aged workers employed in agriculture, which contributes to low business growth incentive; low level of assurance to minimise risks of losses due to natural disasters in agriculture.		
	Risk management conception in agriculture (2007)	Under consideration	Development of mixed (based on public - private partnership) assurance system; effective land-use management; use of the most seasonable cereal varieties	Low level of assurance to minimise risks of losses due to natural disasters in agriculture. Many of the risk factors, being connected with natural disasters and phenomena, resulting in unpredictable losses, and state intervention by irregular compensatory mechanisms are the main reasons why the private insurance system does not function in the field of agriculture yet.	Agricultural and Rural Development Law and its subordinated Regulations On State Support for Agriculture every year estimate compensation extent for damage made in agriculture, but this approach don't include such principles of risk management as subject motivated participation, public - private partnership, elasticity, and support commensurability.	Latvian State Agrarian Economic Institute: http://www.lvaei.lv/ ; Ministry of Agriculture of Republic of Latvia: http://www.zm.gov.lv/?setl=2
	National Programme of	Under implementation			The SFS keeps the	Ministry of Agriculture

	Latvian Forest and Related Sectors				State Register of Forests (SRF) – one of the country’s major forestry databases, representing a unified information system on the forest resources and forest management.	of Republic of Latvia: http://www.zm.gov.lv/?setl=2
	SAPARD Subprogramme 1.2 “Afforestation of Agricultural Lands”	Ongoing				
	Latvian Forest Policy (1998)	Under implementation		Unauthorized felling of trees accounts for a substantial part of forest offences. According to the recent data, unauthorized felling of trees tends to go down both as to the number of cases and the volume of timber felled, including the material loss. In 2005 as compared to 2004, the situation with illegal felling has improved considerably: the number of cases has reduced by 61%, the volume by 42.5 %, the loss by 77%. In 2006, totally 535.4 km of forest roads were built and 413.5 km of drainage systems were built or reconstructed. The Forest Law	In Latvia, the total forest-covered area is 2,923,188 ha or 45% of its land area. With the average forest cover in Europe 33%, Latvia is a country rich in forest resources. The forest ownership is as follows: state-owned forests 1,472,054 ha (50.1%); other ownership forests (private, community, etc.) 1,471,518.1 ha (49.9%).	Ministry of Agriculture of Republic of Latvia: http://www.zm.gov.lv/?setl=2 ; State Forest Service: http://www.iem.gov.lv/?lng=en ;

				provides that the forest roads and drainage systems are forest infrastructure objects pertaining to the forestland and making a part of forest value.		
Practices	State Forest Service (SFS): responsible for pursuing a unified forest policy in all the Latvia`s forests, controlling observance of the provisions of statutory acts, and implementing support programmes, in the long term aimed at ensuring sustainable forest management, inter alia, keep a watch on forest fire safety and bring forest fires under control, administer the state and internationally financed support programmes related to forestry	Ongoing, under implementation	SFS cooperation with the Prosecutor General, Ministry of the Interior, Ministry of the Environment Protection, the Home Guards, the Boarder Guards, and the respective departments of the said organisations, the local authorities and other organisations concerned, as well as with the public at large; supression of large forest fires is time- and labour-intensive, and the operations may last for several days or even weeks, and thereby heavy machinery like excavators and bulldozers must be involved. Because of economic considerations SFS owns no hardware like that.	Because of economic considerations SFS owns no hardware to help bring large scale fires under control	A prompt detection and isolation of fires in all the forests regardless of the ownership are the SFS major objective in forest fire control. For this purpose a national network of lookout towers and fire stations is in place.Nearly all the forest fires are detected from lookout towers normally within half an hour, and a fire brigade of the respective fire station sets off on its mission. Up to 78% of forest fires are detected and suppressed at a short notice, with the burned area no larger than 0.5 ha.	State Forest Service: http://www.vmd.gov.lv/?sadala=71

	Latvian State Forestry research Institute "Silava" researches on interaction of wind and forest (trees) results in windthrow and storm breakage	Ongoing				Latvian State Forestry research Institute "Silava": http://www.silava.lv/
	State stock Company "Latvia's State Forests" (LVM); Forest Management Plans by regional forestries; cultivating seeds and planting stock	Ongoing		More than 800 land melioration objects (with total length 240 thousand km), regulated moisture, drainage, and area mark off, are managed by LVM. At present, the main task is to keep in order or renovate number of those systems	Forests cover 2.9 million hectares of Latvia's territory. The LVM administrates and manages 1.65 million hectares of the land of the Republic of Latvia. Forests cover 1.37 million hectares of it. State-owned forests take up 50%, privately owned forests 43% and forests of other ownership take up 7% of the total area. Wet mineral soils take up 12%, wet peaty soils 11% of the total forest area. A great deal of biological diversity of Latvia's forests is found in these forests. Drained forests (forests on drained mineral soils and drained peaty soils) occupy 22% of the LVM area. The productivity of these forests has increased 2 to 2.5 times in comparison with the forests on excessively	Company "Latvia's State Forests": http://www.lvm.lv/eng/lvm/

					wet mineral and peaty soils before drainage.	
	Latvian State Institute of Agrarian Economics - research on justification on agriculture insurance system development in Latvia (2006)	Under implementation				Latvian State Institute of Agrarian Economics: http://www.econa.lv/
Technologies	Rural Support Service: Annual state subsidies, inter alia, for compensation damage made in agriculture, and for forest and agricultural land (soil) amelioration	Ongoing	Development of mixed (based on public - private partnership) assurance system; effective land-use management		On 2001, the EC Commission made a decision conferring management of aid for pre-accession measures in agriculture and rural development upon the Republic of Latvia. The competent authority has appointed the Rural Support Service for the implementation of the following measures: inter alia, modernisation of agricultural machinery, equipment and construction of buildings; afforestation of agricultural land; development and diversification of economic activities providing for alternative income; improvement of general rural infrastructure	Ministry of Agriculture of Republic of Latvia: http://www.zm.gov.lv/?setl=2 ; Rural support service: http://www.lad.gov.lv/index.php?l=2

Sector: water resources						
Approaches / strategies	Law on Environmental Impact assessment and Regulations of the Cabinet of Ministers No 87 "Procedures for Strategic Environmental Impact Assessment" (2004)	Under implementation	0	As a result of slow development of land and area reform, a large amount of economically and administrative weak municipalities, unable carried out all their functions, still remain in Latvia	The Law on Environmental Impact Assessment defines procedure for the strategic environmental impact assessment. The State Environmental Bureau is a national competent authority, which supervises strategic environmental assessment. SEA is made for a few policy planning documents in Latvia, e.g., "Riga Development Plan for 2006-2018" (2005), "Strategy on Renewable Energy Sources for 2006 – 2013" (2006), "Strategy on Energy Development for 2007 – 2016" (2006), "National Development Plan" (2006). As a result, for example, for Riga and its district detailed flood risk assessment and relevant maps had been elaborate	Ministry of the Environment: http://www.vidm.gov.lv/eng/ ; Environment State Bureau: http://www.vidm.gov.lv/ivnvb/ivnvbe.htm
	National Flood Risk Assessment and Management Plan	Under development		Insufficient operation of River Basin Board; irrelevant statistical data concerning WFD reporting mechanism		Ministry of the Environment: http://www.vidm.gov.lv/eng/ ; Ministry of the Interior:

						http://www.iem.gov.lv/?lng=en ;
	Nature Protection plans for particular territories	Ongoing		As a result of slow development of land and area reform, a large amount of economically and administrative weak municipalities, unable carried out all their functions, still remain in Latvia		Ministry of the Environment: http://www.vidm.gov.lv/eng/
Practices	State research programme on climate change impact on water environment, including adaptation (2006-2009)	Under development				Latvian University, Faculty of Geography and Earth Sciences: lv/eng/general/structure/faculties/geography/index.html
Technologie:	Energy Development Strategy for 2007-2016			In Latvia, a share of three big hydropower plants (HPP) in producing all electric power from renewable energy resources is superlative – 96% (with installed capacity – 1534 MW), and volume of electricity generation directly depends on the through-flow of the river Daugava; for its part the share of renewables in electricity production is 46%. At the same time these HPP together with drift-ice increased flood risk, and demand		Ministry of Economics: http://www.em.gov.lv/em/2nd/?lng=en&cat=3&lng=en

				for new protecting dikes increased. That, for its part, is unacceptable for scientists and nature protectors. Therefore cleaning of Daugava runway would be useful as well. It is necessary to take into consideration that in the period after 2009, the current excess capacity generated by energy systems of the neighbouring countries will diminish, as well as Latvia's opportunity to ensure import of electricity.		
	Latvian Environmental Investment Fund financial support to relevant projects					Latvian Environmental Investment Fund: http://www.lvif.gov.lv/?object_id=372
	Latvian Environmental Protection Fund financial support to relevant projects					Latvian Environmental Protection Fund: http://www.lvaf.gov.lv/
	Renewable Energy Resources Strategy for 2006-2013	Under implementation				Ministry of the Environment: http://www.vdm.gov.lv/eng/
Sector: health						
Approaches / strategies	Strategy for Public Health (2001), Strategy for Public Health Implementing Action Programme 2004-2010	Under implementation	Elaboration and management of all risks concerning healthy and safe environment, and the	Low level of problem's understanding; insufficiency of good governance; bad coordination between		Public Health Agency: http://www.sva.lv/eng/ ; Health Ministry of Republic of Latvia: http://www.vd.gov.lv/ ;

	(2004)		most vulnerable groups; provided appropriate monitoring	state and private structures, and individuals		
Practices	Centre of Emergency and Disaster Medicine (CEDM)	Ongoing			On the request of health care institutions CEDM specialists perform medical evacuation from any health care institution to an appropriate specialized hospital within the borders of Latvia. The mobile intensive care units of CEDM are used for the transportation of patients. Since 2000 CEDM in cooperation with the National Armed Forces of the Republic of Latvia has developed air medical transportation of seriously injured and critically ill patients with the rescue helicopter of the Air Forces.	Centre of Emergency and Disaster Medicine: http://www.emergency.lv/index.php?lang=en
Technologies						
Sector: coastal zones (settlements)						
Approaches / strategies	Integrative Coastal Management Plan for Baltic States and Poland (1998-1999)	Under implementation	The needs to prevent coastal erosion are: enforcement of beach dune belt; reconstruction of land drainage systems; to meet the requirements of regularly state			

			monitoring on geological processes of the sea-coast; to dump the regularly dredged sediments from harbour aquatories and ship route canals in the shallow sea water belt (0-6m depth);			
	National monitoring of geological processes of the seacoast	Ongoing				Latvian Environmental, Geological and Meteorological Agency: http://www.meteo.lv/public/26902.html
Practices	Dump the regularly dredged sediments from harbour aquatories and ship route canals in shallow belt	Ongoing				
Technologies	Latvian Environmental Protection Fund financial support to projects for enforcement of beach dune belt	Ongoing				Latvian Environmental Protection Fund: http://www.lvaf.gov.lv/
	Latvian Environmental Investment Fund financial support to relevant projects	Ongoing				Latvian Environmental Investment Fund: http://www.lvif.gov.lv/?object_id=372
Sector: biodiversity, environment						
Approaches / strategies						
Practices	Nationally and internationally protected nature territories in the coastal	Under implementation				Ministry of the Environment: http://www.vidm.gov.lv/eng/

	belt						
Technologies	Registry on Protected Territories according to the Water Framework Directive (WFD)	Ongoing				<p>Specially protected nature territory system, incorporated in the NATURA 2000 network, covers 12.24% of the territory of Latvia. The majority of the specially protected areas in Latvia is covered by forests – 49% and agricultural lands – 24%, then follows water – 12%, marshes – 14%, and other biotopes – 1%. Environment is rich in protected biotopes of European significance. There are 18 047 species of animals, 5396 species of plants and about 4000 species of mushrooms established in Latvia. According to scientists, about 907 species (3.3 % of all species) are rare and endangered.</p>	Latvian Environmental, Geological and Meteorological Agency: http://www.meteo.lv/public/26902.html
	Latvian Environmental Investment Fund financial support to relevant projects	Ongoing				Latvian Environmental Investment Fund: http://www.lvif.gov.lv/?object_id=372	
	Latvian Environmental Protection Fund financial support to relevant projects	Ongoing				Latvian Environmental Protection Fund: http://www.lvaf.gov.lv/	

Sector: transport, built-environment						
Approaches / strategies	Riga Public Transport Development Conception for 2005-2018	Under implementation	32% from all Latvia's population live in Riga plus a large number works in Riga; thus it is necessary to improve the public transport system in Rīga		Conception prescribes the development of an integrated public transportation system, including further development of the electric transport network and introduction of low floor tram, integration of railroad transport in the common transportation network of the city, etc.	Riga City Municipality: http://www.riga.lv/EN/Channels/Riga_Municipality/Executive_authority/default.htm
	National Programme of Transport Development for 2000-2013	Under implementation				Ministry of Transport: http://www.sam.gov.lv/satmin/content/?cat=134
Practices						
Technologies						
Cross cutting activities						
Approaches / strategies	Precautionary and risk management principles are involved in several overall legislative acts: Law on Environment Impact Assessment (1998), Law on Protected Belts (1997), in regulations on Methodology Stablishment to Protected Belts of the Baltic Sea and the Gulf of Riga, in Law on Water Management (2002), in Law on	Under implementation				Ministry of the Environment: http://www.vidm.gov.lv/eng/ ; Ministry of Regional Development and Local Government (MRDLG): http://www.rapl.gov.lv/eng/

	Territory Planning (2002), in Law on Regional development (2002)					
	Sub-monitoring Programme on Climate Change and Adaptation	Under development				Latvian Environmental, Geological and Meteorological Agency: http://www.meteo.lv/public/26902.html
	Strategy for the Development of Industry, 2004 – 2013	Under implementation				Ministry of Economics: http://www.em.gov.lv/em/2nd/?lng=en&cat=3&lng=en
	National Concept on Innovations	Under implementation				Ministry of Economics: http://www.em.gov.lv/em/2nd/?lng=en&cat=3&lng=en
	National Programme of Innovations for 2003-2006	Under implementation				Ministry of Economics: http://www.em.gov.lv/em/2nd/?lng=en&cat=3&lng=en
Practices						
Technologies	Latvian Environmental Investment Fund financial support to relevant projects	Ongoing				Latvian Environmental Investment Fund: http://www.lvif.gov.lv/?object_id=372
	Latvian Environmental Protection Fund financial support to relevant projects	Ongoing				Latvian Environmental Protection Fund: http://www.lvaf.gov.lv/

Malta						
Scope of adaptation action:						
<i>regional level</i>						
Approaches / strategies						
Practices						
Technologies						
<i>national level</i>						
Approaches / strategies					Process has only recently been implemented, so too early to comment.	http://www.defra.gov.uk/environment/climate_change/uk/adapt/policyframe.htm
Practices						
Technologies						
<i>local (community) level</i>						
Approaches / strategies						
Practices						
Technologies						
Sectoral level						
Sector: agriculture						
Approaches / strategies	The draft National Rural Development Strategy for the period 2007-2013 recognises that the impact of inundation, increased risk of flooding,	Strategy is under development (consultation).	Approval of the Strategy.	Limited awareness on need to adapt to climate change.	Consultation with stakeholders is crucial for ownership of decisions.	www.agric.gov.mt/rural_dev.htm

	deterioration and erosion of soil, accelerating desertification processes, as well as damage to the landscapes, agriculture and animal husbandry operations and to natural terrestrial and marine ecosystems with loss of biodiversity. It also highlights the shortage of water supplies expected to be further exacerbated. The Strategy outlines priority actions to be undertaken in order for agriculture to adapt to climate change.					
Practices						
Technologies						
Sector: water resources						
Approaches / strategies	PRODIM is a transnational co-operation project financed under the EU Programme – Interreg III B Archimed. The overall objective of the PRODIM project is to develop a comprehensive proactive management plan to combat drought and water scarcity in	under implementation	Water efficiency and conservation measures to be fully integrated within general water policy and other national policies eg land-use, CAP, urban-planning, tourism, industry etc.	Practices and consumer behaviour	sharing of ideas/concerns and learning from foreign experiences	www.project-prodim.eu

	drought-prone areas of the Mediterranean region with particular reference to the islands and coastal areas.					
	WATER-MAP is a transnational co-operation project financed under the EU Programme – Interreg III B Archimed. The overall objective of the PRODIM project is the application of the DRASTIC method in the Archimed area in order to produce vulnerability maps related to groundwater pollution, and the utilisation of these maps in a spatial model for the monitoring and management of groundwater resources.	under implementation	Support to a strategy for groundwater protection and heightened public awareness campaigns	Land-use activities	learning from the difficulties of incorporating physical and human induced factors into groundwater vulnerability maps; integrating maps into the planning process.	
	INWATERMAN is a project financed under the EU Programme – Interreg III A - cooperation between Italy and Malta 2004-2006. The overall objective of the INWATERMAN project is the sustainable management of conventional and non-conventional water	under implementation	Guidelines for different reuse applications, quality standards and code of good practice. Legal requirement for the re-use of non-conventional water sources; need for further data gathering	Public acceptance, health and safety issues, cost-effectiveness.	sharing of ideas/concerns and learning from foreign experiences	www.inwaterman.eu/

	resources in arid and semi-arid insular settings.					
Practices	In the context of the implementation of the European Union (EU) Water Framework Directive (WFD), the Malta Resources Authority (MRA) has launched a project for the development of the programme of measures in the Maltese Water Catchment District. The project focuses on groundwater resources and water supply and aims at identifying the most cost-effective option for restoring the status of groundwater resources in line with the requirements of the WFD.	under implementation	Will be integrated within the Water Catchment management Plan	Economic impact of measures on current water-supply practices. Sectoral demand High cos	Need for stakeholder involvement throughout the process of identification of possible measures	http://www.mra.org.mt/wfd_introduction.shtml
	The Water Framework Directive (2000/60/EC), transposed into Maltese Legislation by Legal Notice 194 of 2004 (Water Policy Framework Regulations, 2004) provides for the long-term sustainable management of water resources on the basis of a high level of	Under implementation				

	protection of the aquatic environment.					
	Storm Water Management National Plan	Under preparation				
Technologies	Reverse Osmosis,	Upgrading of facilities with new membranes and energy recovery devices to improve unit cost of desalinated product	Financing	Cost of water		http://www.wsc.com.mt/default.aspx?MLEV=4&MDIS=15
	Water catchment technologies	Cleaning of dams and maintenance of reservoirs	Financing	Preservation of ecosystems		
	Leakage detection technologies	Increased investment in "smart" devices to control pressure and flow thru the network; intensification of leakage detection programmes by the utility, meter replacement	Financing	Urban activity		http://www.wsc.com.mt/default.aspx?MLEV=4&MDIS=15
	Sewage treatment technologies	Construction of two facilities, in Malta and Gozo to be completed by 2007. Third facility in planning application stage.	Financing	Public acceptance, cost of product, cost recovery, health and safety		
Sector: health						
Approaches / strategies						
Practices	In relation to the need to adapt to hot weather conditions, information campaigns are regularly carried out targeted at vulnerable groups (eg	Under implementation.	Not yet evaluated	Early status of implementation	Not yet available	http://www.health.gov.mt/dph/ehuhome.htm

	<p>elderly) and the general public. Malta also publishes and communicates UV and heat stress indices. It is regular practise to take care in planning of events for vulnerable groups (eg school sports days moving from June to April). Alerting public when heat waves expected, informing people not to go outdoors during midday hours.</p>					
Practices	<p>In relation to increased risk of disease with climate change, there are various practises which would contribute to the adaptation effort. These include monitoring and information campaigns related to quality of bathing water, vaccination programmes; regular surveillance for specific climate change related diseases such as lyme borreliosis and tickborne encephalitis; fumigations of all aeroplanes coming from malaria zones; mandatory vaccination</p>	Under development	Not yet evaluated	Early status of implementation	Not yet available	http://www.health.gov.mt/dsu/index.htm

	certificates for travellers coming from areas prone to yellow fever, awareness-raising programmes on food hygiene and diseases such as salmonella.					
Sector: coastal zones (settlements)						
Approaches / strategies	In the framework of the Mediterranean Action Plan (MAP) and within its Coastal Area Management Programme (CAMP), a project for Malta was launched in November 1999. The Project was oriented towards sustainable management of the coast of Malta (in the Northwest area) and considered climate change and adaptation within its scenarios. A Soil erosion / desertification control management activity was implemented within the CAMP Malta Project.	implemented	Long-term benefits of conservation and restoration of resources and habitats. There is a greater need for a more active involvement and participation of NGOs, when dealing with coastal zone issues.	New tools and techniques of ICAM were introduced and applied during this Project. It was observed that however, the methodologies have to be adapted to the small scale of Malta.	Project was a success in that it brought together all concerned regulatory and implementing agencies, stakeholders, NGOs discussing one goal; Greater need for multidisciplinary approach towards sustainable coastal zone management; Inter disciplinary appro	http://www.pap-thecoastcentre.org/about.php?blob_id=36&lang=en
Practices						
Technologies						
Sector: biodiversity, environment						
Approaches / strategies	In the analysis of land-use issues, landscaping	Under implementation			The integration of habitats and species	

	and in the management of sites (including habitat types and species) the 'ecosystem approach' is considered a method of adjusting to the impacts of climate change on biodiversity.				into one aspect (as in the implementation of the Habitats Directive) and the integration of land-use planning and environment protection within the Malta Environment and Planning Authority is an advantage in this re	
	The NBSAP process and the National Plan for Sustainable Development in Malta raise the issue of the habitat fragmentation and habitat/species restoration.	Under consideration	Investments in the field of habitat restoration and creation.	Provision of human and financial resources.		
Practices	Effective Management of the Natura 2000 Network: Aspects related to the impacts of climate change will be included in new management plans for Natura 2000 sites including defragmentation and connectivity, and monitoring.	Under consideration	More information is required, in the absence of which the precautionary approach will be adopted.			
Technologies	Appropriate urban and infrastructure planning devices (e.g. canals, bridges, road route assessments) can be used to safeguard the integrity and connectivity of			Lack of consideration at transport planning phases		

	ecosystems.					
Sector: transport, built-environment						
Approaches / strategies	The Structure Plan for the Maltese Islands (replacement) will envisage land use planning opportunities to reduce hazards, which may include latent conditions from natural processes such as geological e.g. subsidence and hydro meteorological e.g. flooding and sea level rise and reduce risks by directing development location, density and expansion, in particular the siting of key installations, roads, water, sewage and other critical facilities, in hazard-prone areas such as built up areas located in valleys, on clay slopes, cliff edges, ridges and low lying coastal areas.	Being completed				
	Within Local Plans, the Malta Environment and Planning Authority identifies flood prone areas to highlight risks for development in these areas, encourage better storm water management practices	Under consideration				

	and calls for flood risk assessments for large projects.					
Practices						
Technologies						http://www.solaterm.eu
<i>Cross cutting activities</i>						
Approaches / strategies	The Civil Protection Department of Malta developed a flood warning system giving a warning for a certain amount of precipitation and intensity which will lead to a volume of water that is hazardous for safety of humans in urban and specific areas which are prone to flooding.	Implemented				
Practices	The government is planning a major flood relief project for Birkirkara which will involve the catchment of storm water coming from Mosta, Naxxar, Iklin, Attard and Balzan, its storage in galleries and its use for irrigation. The galleries built recently would be used to carry pipes to pump this water to different parts of Malta where it could be used by farmers. This would	Under consideration				

	mean that less water would be extracted from the aquifer, giving it time to recharge itself in volume and quality.					
Technologies						
Sector: weather monitoring						
Approaches / strategies						
Practices	Activities currently underway mainly involving ongoing monitoring, data storage and forecasting on expected changes in temperature and precipitation, as well as weather forecasting.	Ongoing			Ongoing monitoring is instrumental in predicting heat waves and severe weather.	http://www.maltairport.com/weather
Technologies						

Netherlands	The Netherlands. National Spatial Strategy: Creating space for development. Available at http://www.vrom.nl/pagina.html?id=2706&sp=2&dn=4179 .					
Scope of adaptation action:						
<i>national level</i>						
Approaches / strategies	National Spatial Strategy: Strong emphasis on co-operation with local and regional authorities - Regional plans must include "water test", ensuring that spatial plans consider water management from the start	ongoing				

	Space for the Rivers Policy Programme: - Creation of extra space for rivers to adapt to higher levels of river discharge, thus reducing flooding risk - Zoning of land around major rivers to reduce groundwater and surface water pollution	under implementation				
	Adaptation strategies to reduce risk of coastal flooding: - Restrictions on development near and inside dykes, i.e. expansion ban within 100 metres inside the dykes and 175 metres outside the dykes - Designation of 8 sites along coastal foundations as high-priority for maintenance and improvements to strengthen sea defences	ongoing				
	NBW: Agreement between authorities on incorporating climate change into planning for 2015	ongoing				
Practices						
Technologies	Additional pumping capacity at pumping station IJmuiden (realised 2003)	ongoing				
	Doubling of the	under consideration				

	discharge capacity of the sluices in the Afsluitdijk (IJsselmeer) (planned for 2008)					
	Strengthening of the coastal defence (zwakke schakels) also incorporation sea level rise	ongoing				
	Extension of beach nourishment programme	ongoing				
	Replacement of revetments Oosterschelde and Westerschelde	ongoing				
	Spatial reservation for the coastal zone taking into account a sea level rise of 85 cm and a time horizon of 200 year.	ongoing				

Source: Water-Conference & EEA Questionnaire

Sectoral level

Approaches / strategies	The agricultural sector has the responsibility to cope with climate change. This means that farmers should optimize their production process. This involves choices about what to produce and where. The government has an supportive task to provide alternatives through science and	ongoing	It is very important that farmers are well equipped to make micro economic choices. This means that information about the actual impact of climate change in an area, policy actions, and adaptation possibilities are essential.	Identified knowledge gap has not only limits to the possible effects of various management strategies but also included knowledge on when to act or when not to act in order to improve effectiveness of management and policies. These management strategies require a continuous awareness of the		For more information on adaptation practices: The Netherlands Environmental Assessment Agency (MNP) organizes for the Netherlands Ministry of Housing, Spatial Planning and the Environment (VROM) the Scientific Assessment and Policy Analysis programme (WAB)
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	make instruments climate proof. Adapting to changing conditions is to a large extent normal agricultural practice. Dutch farmers have been highly successful in doing so given that they have adequate technical training and financial resources.			possible and actual impacts of climate change and the time frame needed to develop, implement and activate adaptation strategies.		(http://www.mnp.nl/en/themasites/wab/index.html) MNP has compiled the report 'Climate adaptation in the Netherlands' this can be found on http://www.mnp.nl/en/publications/2006/ClimateAdaptationintheNetherlands.html
Practices	The Dutch government and the agricultural sector reached agreement on a state guarantee for insurance policies for damage as a result of heavy rainfall. In return the sector will not longer apply for government compensation in the case of an extreme event. As a result crop damage caused by heavy rainfall is an insurable risk in the Netherlands since 2004.	ongoing		There is not enough data available of weather related damages and the changes of this damages as a result of climate change. This makes a sufficient basis for instruments hard.	Rain insurances are ongoing and it's under consideration to enlarge insurance possibilities to damages related to drought, snow and frost events. Studies show that farmers are not using the available tools adequately. It is important to raise the awareness of farmers of the impact of risk exposure has on their business and of the tools they can use to manage these risks	
Sector: water resources						
Approaches / strategies	Water managers throughout the Netherlands, both Rijkswaterstaat for the large river, lake and coastal water systems and the regional Water	ongoing	Attention should be given to the design of suitable strategies in order to integrate successfully water management and nature. Next to the	It is worth looking at the meaning of natural processes for adapting to climate change. Costs will depend on the strategy taken into account. 'More space'	In recent Dutch history, the original surface area of natural river floodplains has decreased by more than 90%, which has contributed to both the	National policy documenta 'Ruimte voor de Rivier', "Zwakke Schakels", can be found on www.vrom.nl . More information about

	Boards for the smaller backwater systems, are currently developing several adaptation strategies, aimed at re-arranging the spatial design of the landscape to enhance its flexibility to retain and store freshwater surpluses at times of high precipitation and/or peak river discharges and, at the meantime, to enhance flow capacities of the river systems to ensure their ability to cope with higher peak discharges.		costs for designing a successful strategy, there will be construction and management costs to take into account.	for water and nature implies the acquisition of land and the potential loss of income due to a change in land use. Due to the high costs of land, the investment costs are expected to be high. Further concerns are future climate changes and the ability to cope with for example more extreme climate scenarios (several metres sea level rise) instead of 85 cm in 2100?	lessened resilience of the river system to high peak discharges and the development of valuable ecosystems and habitats in close proximity to the river that do, however, not allow frequent inundations. Moreover, riverine forests are considered a threat to water quantity managers, because they increase the so-called 'roughness' of the floodplain and thus enhance any occurring discharge peaks. Therefore, although more 'space' for the natural river does offer opportunities for enhancing 'robustness' of riverine nature and opportunities for nature development, the programme as a whole will have to be carefully implemented in order to avoid irreversible damages to existing conservation values.	financing mechanisms and payments/rewards for ecosystem services can be found at http://www.naturevaluation.org . Some attempts to involve the private sector have been made within the WINN program (http://www.waterinnovatiebron.nl), however the program pertains mainly to the water sector. The general outline of this new concept of water management (Water Management of the 21st Century) is described in a policy paper called 'Treating with water differently'. The water sector is covered by the Climate Adaptation in the Netherlands http://www.mnp.nl/en/publications/2006/ClimateAdaptationintheNetherlands.html
Practices	Used technologies re-enforcement of dikes and embankments) to rather more innovative ways like enhancing					

	the floodplain areas of the rivers (e.g. by re-allocating the dikes of the major embankments) and designate certain rural areas especially for storage of freshwater surpluses					
Technologies	adjustment of retention, storage and discharge systems changing of dredging regimes to maintain navigability modification of sluices and pumping stations adjustment of drinking water systems creation of compartments, to lower the risks of flooding					
Sector: health						
Approaches / strategies	Within the Netherlands the following possible impacts were identified: increase in heat-related mortality, increase of air pollutants; risk of more Lyme disease cases, food poisoning and allergic disorders.	under consideration	Attention should be given to the design of suitable strategies and the integration in to the ongoing health care planning			
Sector: coastal zones (settlements)						
Approaches / strategies	Integrated Coastal management; Sea level rise and flooding are main threats in the	under development		The last decades (since the 1953 flood) the attention was strongly focused on the height		www.verkeerenwaterstaat.nl

	coastal areas, especially in low-lying areas. These weak links in coastal areas area addressed by insurance of the safety against flooding by a 'sandy strategy', which is: suppletion of sand in front of the coastline and on beaches.			and the strength of the dikes. However, the economic risk has increased; the economic value of the Netherlands increased with a factor 6 since the fifties. A second factor is the population growth and subsequently, the chance of a larger number of casualties has increased.		
Practices	Re-establishment of the natural dynamics of the dunes. Use of natural areas (e.g. peatlands). These natural areas, besides enhancing the natural functions of the coastline, can increase the water retention capacity of the coastal zone, reduce the risk of salt water intrusion caused by sea level rise (Van Ierland, 2001) and prevent damage to the natural system.	under development				
Technologies	maintaining the shoreline and controlling of coastal erosion rates by dredging and sand supply water level control in polders to prevent increasing salinization and to slow	under development				

	down land subsidence					
Sector: biodiversity, environment						
Approaches / strategies	In order to cope with climate change the connections/corridors between natural reserves are reinforced and enlarged.	under implementation	to examine what provision is already being made to enable biodiversity to adapt to climate change and to identify approaches which can assist wildlife to survive. The aim is to find solutions that minimize the impacts of climate change on biodiversity. The modeled scenarios and potential adaptation solutions will be tested in the province of Limburg and also in other areas in the UK and Germany	Are The Netherlands able to cope with the rapid change of ecosystems? How can we change our 'static' preservation strategy in a more 'dynamic' preservation/migration strategy? The costs for the design and the implementation of a climate change proof National Ecological Network are unknown.		Nota Ruimte, www.vrom.nl Information about ecological network programmes in Central and Northern Europe can be found at http://iucnce.org/econets/database/ . (more information on the monitoring of the effectiveness can be found at http://branchproject.org/). Alterra Green World research is currently analyzing strategies in order to optimize the potential of the NEN under predicted climate change scenarios (more information can be found at http://www.onderzoekinformatie.nl/en/)
Practices	The effectiveness of the ecological networks as adaptation strategy is currently (Branch, INTERREG III project) reviewing policy plans across the UK, France and the Netherlands.	under development				
Technologies						
Sector: transport, built-environment						
Approaches /	Pilot 'building with	under development	A broadly supported	The 'Deltametropool'		

strategies	water' with integrated water management and urban functions. The innovative knowledge development that can be applied in areas at home and abroad with similar problems		design for a "building with water' that sets a good example. A demand driven generation of the knowledge.	in the West of the Netherlands faces a number of problems in the field of water management and use of space that hamper a sustainable solution. 1. space is scarce 2. dehydration or hydration (location dependent) 3. Increasing costs for traditional construction 4. Pilot projects for water-conscious construction get insufficiently off the ground		
<i>Cross cutting activities</i>						
Approaches / strategies	National Spatial Adaptation Strategy to Climate Change (national government in cooperation with waterships, regional and local governments): This strategy focusses on the effects of climate change in the Netherlands, main themes: safety (against flooding), the environment, biodiversity and economic sectors. The strategy is stressing the need for spatial	under development	A successful implementation of the national adaptation policy is depending on awareness/sense of urgency of politicians and society.	Are The Netherlands able to cope with more extreme climate scenarios (several metres sea level rise) instead of 85 cm in 2100.	It is worth looking at the meaning of natural processes for adapting to climate change.	www.versnellingark.nl

	adaptation to climate change and is using leading principles in order to spatially adapt to climate change. It also stresses the need for a transition within society (awareness -> action). In 2007 the national government will decide on the national strategy and on a national adaptation agenda.					
	Support to governments in developing countries to develop and implement climate policies. Furthermore climate quick scans have been carried out, this lead to a climate risk scening in three countries: bolivia, bangladesh, Ehtiope	implemented, follow up under consideration	more support, awareness raising needed from practitioners; making results more tangible and specific; follow up will indicate the succes of the quick scan approach		quick scans seems a good tool to set priorities for adaptation measures at relative low cost, no prescribed tool was used, leaving flexibility for the consultants to work on a taylor made basis, using their own knowledge and experience in development	see the website for more information www.nlcap.net

Portugal						
Scope of adaptation action:						
<i>regional (sub-national) level</i>						
Approaches / strategies	Integration of the General Directorate of Health in the National Committee for					

	Droughts					
	Development of a Contingency Plan for Heath Waves. The main objective is to reduce the morbidity and mortality related to heat waves.					
	Protection of health during cold spells					
Practices	the ones mentioned in the other sheet					
Technologies						
<i>national level</i>						
Approaches / strategies	Integration of the General Directorate of Health in the National Committee for Droughts					
	Development of a Contingency Plan for Heath Waves. The main objective is to reduce the morbidity and mortality related to heat waves.					
	Protection of health during cold spells					
Practices	the ones mentioned in the other sheet					
Technologies						
<i>local (community) level</i>						
Approaches / strategies	Integration of the General Directorate of Health in the National Committee for Droughts					

	Development of a Contingency Plan for Heath Waves. The main objective is to reduce the morbidity and mortality related to heat waves.					
	Protection of health during cold spells					
Practices	the ones mentioned in the other sheet					
Technologies						
Sectoral level						
Sector: health						
Approaches / strategies	Integration of the General Directorate of Health in the National Committee for Droughts, comprising:	Ongoing (the Committee has been set up in 2005)		Lack of epidemiological studies on the effect of droughts on human morbidity and mortality	The articulation between public health services and the entities responsible for the protection of water sources and for water distribution is very important in what protection of health is concerned	1. General Directorate of Health website www.dgs.pt 2. Institute of Water website www.inag.pt 3. Orientation to public health services concerning measures to be taken during drought periods (Orientation issued by the General Directorate of Health numb. 16, 10th of May 2005).
Practices	1. Increased monitoring of the quality of water sources and of the water distributed for consumption					
	2. Inventory of alternative drinking water sources					
	3. Monitoring of the					

	drinking water provided by alternative sources such as water tank trucks and wells					
	4. Increased monitoring of the bathing water quality					
	5. Leaflet for population awareness with recommendations related to: - Disinfection of containers used in the collection of water provided by water tank trucks - Disinfection of water provided by private sources of water such as wells - Risks associated to contaminated bathing areas					Leaflet " Drought, health risks". General Directorate of Health, 2005
	6. Protection of water sources, namely, from leftovers of forest fires and other sources of pollution					
Approaches / strategies	Development of a Contingency Plan for Heat Waves. The main objective is to reduce the morbidity and mortality related to heat waves. The plan includes:	Ongoing (developed in 2004 and updated every year)	Involvement of entities other than the ones indicated, such as the entity that runs private nursery homes.	Lack of epidemiological studies on the effect of heat waves on morbidity and mortality	The involvement of different entities responsible for the protection of the population such as hospitals, health centres, social security (responsible for the protection of the elderly living in nursery homes),	Contingency Plan for Heat Waves. General Directorate of Health.(the plan for 2007 has been approved by the Ministry of Health and will be launched on the 18th of April)

					municipalities (responsible for providing shelters that can be used during heat waves) is crucial for the protection of health	
Practices	1. Participation of other entities responsible for people's protection, such as the Institute of Social Security and the Civil Protection Service					
	2. Development of a heat wave awareness system by the General Directorate of Health and based on information provided by the Meteorological Service (ex. temperatures, UV), the Institute of Environment (ex. trophosferic ozone), the National Institute of Health (responsible for ICARO Index that predicts mortality according to predicted temperatures). The heat wave awareness system comprises 3 levels of alert, corresponding to different actions to be taken by the entities involved.		Improvement of the criteria used for the definition of levels of alert based on the relation among temperatures, ozone and UV levels on morbidity and mortality	Difficulty in establishing criteria for the definition of alerts related to the impacts of temperatures, ozone and UV levels on human health		
	3. Awareness of the population and its					1. Leaflet " Heat: Danger to Health".

	<p>vulnerable groups (elderly, isolated people, people with heart and respiratory diseases), through:</p> <ul style="list-style-type: none"> - leaflets and posters - call centre providing information related to heat waves and recommendations for health protection 					<p>General Directorate of Health. 2. Poster " Heat: Danger to Health. How to protect your health". General Directorate of Health. 3. Call Centre 808 211 311 - Linha Saúde Pública</p>
	<p>4. Implementation of measures by local health services, prior to summer time such as:</p> <ul style="list-style-type: none"> - identification of places that can be used as shelters during heat waves - identification of vulnerable groups such as elderly, people living alone and isolated, people with heart and respiratory diseases - installation of air conditioning in hospitals and health centres - provision of adequate stocks of pharmaceutical products, and human resources during periods of increased number of patients due to heat waves 					

	<p>5. Implementation of measures by local health services during heat waves, such as:</p> <ul style="list-style-type: none"> - transport of people to shelters - health care in shelters - health protection during special events such as concerts, festivals, sports activities 					
	<p>6. New informatic's channels of information between public health services at different geographical levels, to provide information on:</p> <ul style="list-style-type: none"> - alerts - activities developed by health services related to heat waves such as the ones mentioned above) 					
	<p>7. Monitoring of the demand for emergency services in hospitals and health centres during heath periods (this is done through specific software - SINUS and SONHO)</p>		<p>1. Integration of all hospitals and health centres in SINUS and SONHO 2. Identification of the cause of morbidity of people going to emergency services during heat periods</p>	<p>Lack of information concerning the cause of morbidity of people going to emergency services during heat periods</p>		
	<p>8. Monitoring of mortality during heat periods</p>		<p>Identification of the cause of mortality</p>	<p>1. Lack of updated information concerning mortality 2. Lack of information</p>		

				concerning the cause of mortality during heat periods		
	9. Courses for hospitals, health centres, nursery homes and day centres on the identification of health symptoms related to heat and on treatment procedures					
	10. Research on the impact of heat on the elderly living in nursery homes	under development				
Approaches / strategies	Protection of health during cold spells					General Directorate of Health website www.dgs.pt
	Awareness of the population on how to protect their health during cold spells	ongoing				
	Research on the impact of cold on the elderly living in nursery homes	under development				
Technologies						
Sector: water resources						
Approaches / strategies	Legal and institutional systems restructuring, following the approval of a new Water Law; The new legal and institutional framework reinforces the role of economic instruments in water management, promotes stakeholders involvement and	Under implementation		The new legal and institutional framework is the necessary background for effective water management strategy and policies; It does not directly address climate change concerns, vulnerabilities, impacts		www.inag.pt

	enhances public awareness and participation			and risks.		
Approaches / strategies	National Adaptation Plan for the Water Resources Sector closely integrated with the National Climate Change Adaptation Plan and the new Generation of River Basin Plans	Under consideration		The success of this approach requires a close integration of several strategies and instruments in order to produce a clear implementation plan with concrete actions to be taken in a wide variety of sectors.		
Approaches / strategies	National Program for an Efficient Use of Water (PNUEA)	Under implementation		The program was not specifically designed as an adaptation strategy but its goals and measures address the demand management concerns .		www.inag.pt
Approaches / strategies	Explicit consideration of Climate Change Scenarios in the new generation of River Basin Plans (PGRH)	Under implementation	A clear, practical and well accepted guide to include climate change concerns in this major water planning exercise is needed.			
Approaches / strategies	Explicit consideration of Climate Change Scenarios in the ongoing restructuring effort of the Water Supply and Drainage Sector (PEASAAR)	Under consideration	A clear, practical and well accepted guide to include climate change concerns in this major construction effort is needed, based on a sound cost-benefit analysis.			
Approaches / strategies	Research and developments efforts on Climate Change, Climate Change Impacts and Adaptation	Ongoing		Mainly performed in universities, sponsored by the European R&D Framework Programs; more applied research		

				is needed.		
Practices	Several ad-hoc specific measures in the licensing, land use management and infrastructure domains which enhance the country adaptation capacity	Under implementation	There is a need to organize these disparate measures in a coherent and permanent strategy.			
Practices	Operational bodies for water management and emergency situation management	Ongoing		Although not a adaptation action it is an existing asset which is crucial to promote climate change adaptation		
Technologies	National Water Resources Monitoring System (SNIRH) and Forecast system (SVARH) for an effective water management policy and for flood and drought forecast and management	Ongoing		Although not a adaptation action it is an existing asset which is crucial to promote climate change adaptation		snirh.inag.pt
Technologies	National Inventory of Water Supply, Drainage and Treatment Infrastructures (INSAAR) for an effective water management policy	Ongoing		Although not a adaptation action it is an existing asset which is crucial to promote climate change adaptation		svarh.inag.pt
Technologies	National Water Usage Licensing System (SNITURH)	Under implementation		Although not a adaptation action it is an asset which is crucial to promote climate change adaptation		

Sector: coastal zones (settlements)						
Approaches / strategies	The new legal and institutional framework, following the approval of a new Water Law, reinforces the need for a Coastal Authority and a legal instrument is being planned for coastal protection by ruling, among others, land uses in areas directly related with coastal risk of flooding.	Under implementation				
Approaches / strategies	Portugal coast is ruled by Coastal zone management plans, witch had already taken in to account studies about flooding risk in coastal areas and other risks related to cliffs and dunes stability. Areas of coastal protecting barriers were established where constructions are not permitted. The principal goal of these plans is the protection of the coastal systems. According with UE, Portugal is working on the approach of Integrated Costal Zone Management, that recommend a strategic	Ongoing	There is a need to organize all the principle in a coherent and permanent strategy.	The success of this approach requires a close integration of several strategies and instruments in order to produce a clear implementation plan with concrete actions to be taken in a wide variety of sectors.		

	approach and reinforces the importance of promotes stakeholders involvement and enhances public awareness and participation and also the scientific knowledgement of the coastal systems.					
Practices	The implementation of the coastal zone management plans depend on several institutions, and government has established "Priorities Plans for 2007-2013", where national priority actions has been identified. There were identified 3 categories of actions: A- Coastal Defence/ Risk Areas; B- Intervention Plans for Requalification of Urban areas, where demolitions are identified; C- Management and Monitoring.	Ongoing	A consideration of climate change concerns in this major effort is needed	The success of the implementation of these actions requires a close integration of several authorities.		
Technologies						
Sector: forests						
Approaches / strategies	National Strategy for Forests:1 Protection of forests against wildfires	Ongoing; Under implementation and development				Resolution of Ministry Conseil 114/2006; www.dgrf.min-

	<p>(National plan for the protection of forest against wildfires; Fuel management by grazing; Use of biomass as a source of renewable energy); 2 Protection of forests against pests, diseases and invasive species; Restoration of affected ecosystems; 3 Territory specialization; 4 Productive improvement through sustainable forest management (Increase the productivity of forest stands through sustainable management; Increase the productivity of other forest products; Management advisory and support services); 5 Reducing market risks and raising the value of forest products (Forest certification; Raising the value of forest products); 6 General improvement of forest sector efficiency and competitiveness (Information about the sector; Land registry; Sector organization; Sector agents' qualification;</p>					agricultura.pt
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	Application of scientific knowledge); 7 Rationalization and simplification of politic instruments (Organic, legal and planning instruments; Financial support to competitiveness) 8 Strategy execution (Responsibility matrix and indicators; Evaluation).					
	National Plan for the Protection of Forest against Wildfires: 1. Increase territory resilience against wildfires; 2.Reduction of Fires incidence; 3.Improve the efficiency and organization of attack.	Ongoing; Under implementation and development				www.dgrf.min-agricultura.pt;
Sector: agriculture						
Technologies	Implementation of several new irrigation schemes, private or collective	under implementation				
	Rehabilitation of existing irrigation schemes to improve irrigation efficiency	under implementation				
	Groundwater abstraction for animal husbandary in drought conditions	under implementation				

Cross cutting activities						
Approaches / strategies	Portuguese National Action Program to Combat Desertification - Axes of intervencion: Soil and water conservation; Recovery of areas most threatened by desertification; Research, experimentation and diffusion; Ensuring that desertification is included in development policy; implentation, monitoring and assessment.	Ongoing; Under implementation and developmen				www.dgrf.min-agricultura.pt; http://panda.igeo.pt/pancd/; http://www.unccd.int/main.php

Romania						
Scope of adaptation action:						
<i>national level</i>						
Approaches / strategies	National Action Plan on Climate Change (2005): highlights the need for an Action Plan on Adaptation by 2007	under consideration				Source: Water-Conference & EEA Questionnaire
Approaches / strategies	Research National Program to asses the Romanian agroclimatic potential and establishing the	under consideration (prposal for a reserch project in the framework of the National Research Plan	to strenghten the relationship between research units and the beneficiaries of the results;	limited human and co-financing resources, difficulties in involving young researchers	the number of projects in competition is big comparing with the allocated financial resources	

	favorableness for the main crops in order to initiate a sustainable management system in the agricultural domain, according current climate and climate change scenarios	Partners: National Meteorological administration, Agricultural and Forestry Science Academy and other Agricultural Reserch Units located in different climatic areas				
Practices	A new agro climatic mapping "AROCLIMA ROMANIA" containing a new regionalization and classification of vulnerable areas to extreme events, with different risk degrees, e.g. degree I - when more than 3-4 limitative conditions are meat in the same time (high temperatures, low precipitations, drought seasons, most vulnerable areas to drought	under consideration	ToRs, Programme draft, identification of fincing sources (internal, external)			
Technologies	implementation of "dry-farming" technologies in the most vulnerable areas to drought: to develop crop schemes, with better limitative	under consideration	the necessity to change the structure of crop systems	limited collaborationbetween authorities, limited awareness of farmers	to early to comment	

	climate conditions tolerance					
regional level						
Approaches / strategies	the implementation of pilot studies, CEEX, INISA Project, 2006-2008	ongoing	the identification and development of researches based on environmental friendly technologies and bioresearches, in order to be used in economic activities	low institutional colaboration being a new technology, there were difficulties to raise awareness of potential beneficiaries	need to increase the institutional cooperation	the project was presented as a case study in WG1/Crissoupolis-INTERREG IIIB-ACCRETE http://www.accrete.eu
Practices	the use of wind energy for the irrigation of the drought vulnerable areas	under implementation a study was developed in order to identify the areas with wind potential < 4m/s and vulnerable to drought	to organise a successful awareness campaign to ensure a funding system in order to allow the farmers to use this system	limited financial resources for farmers farmers limited access to information and difficulties in the dissemination of the results of the project	to early to comment	the results will be disseminated in 2008, by workshops and meeting with farmers to make them aware about the benefits of such a system.; a dedicated webpage will be created (INCAS CO))
Technologies	wind meals to be placed in areas with wind potential < 4m/s and vulnerable to drought, the irrigated surface < 1ha	under consideration the system will be tested	to organise a successful awareness campaign to ensure a funding system in order to allow the farmers to use this system	limited financial resources for farmers farmers limited access to information and difficulties in the dissemination of the results of the project	to early to comment	the results will be disseminated in 2008, by workshops and meeting with farmers to make them aware about the benefits of such a system.; a dedicated webpage will be created (INCAS CO))
local (community) level						
Approaches / strategies	River basin management plans					
	Specialised assistance dedicated to local communities regarding the adaptation of the	ongoing	Meeting with "end-users", awareness campaign	"users perception"	Change of the "attitude" toward environment, reorientation toward	http://www.accrete.eu http://.accrete.inmh.ro

	technologies and agricultural practices to climate change - Attitude Code for Farmers				unconventional resources valorification, bio-ecological	
Practices	Chapter 3 of the "Attitude Code for Farmers" contains brief description of practices, benefits and dangers. Topics: soil and land use, water management in agriculture, diseases and pests.	ongoing	Evaluation on current studies in this field, cross-cutting analyses and options selections.	high number of studies, different references periods, the necessity of regional approach and evaluation based on reference indicators		http://www.accrete.eu http://.accrete.inmh.ro
Technologies	Minimum tillage system bio-ecological land works	ongoing	Evaluation on current studies in this field, cross-cutting analyses and options selections.	high number of studies, different references periods, the necessity of regional approach and evaluation based on reference indicators		http://www.accrete.eu http://.accrete.inmh.ro
Sectoral level						
Sector: agriculture						
Approaches / strategies	Assessment of climate change impact on agriculture, recommendations for good practices to mitigate effects of climate change, to combat drought and desertification, and to efficient water use in agriculture. Ongoing projects: ACCRETe: "Agriculture and Climate Changes: how to Reduce human	- under implementation	Improve the international collaboration through research projects and increase technology transfer by experience exchange		integration of the agro meteorological stations in a unique network that allows centralized collection of data, analysis, and interpretation is crucial for climate change impact assessment; periodical training of the agro meteorologists and efficient dissemination of the information to end-users are key factors	http://www.accrete.eu http://www.cecilia-eu.org/

	<p>Effects and Threats” - 2005 – 2007, INTERREG III B CADSES, Measure 4.2.: “Promoting risk management and prevention of disasters”; CECILIA: “Central and Eastern Europe Climate Change Impact and Vulnerability Assessment”, SIXTH FRAMEWORK PROGRAMME, Sub-priority 1.1.6.3 “Global Change and Ecosystems”</p>				<p>for success of adaptation measures</p>	
	<p>Research sectoral programmes aimed to the elaboration of specialized agricultural systems/reference climatic regions taking into account their vulnerability to extreme events and impact on vegetal production. Changes of the crop systems and structure, obtaining new genotypes with high tolerance to extreme events, annual planning and establishing of the crops, including plant species and hybrids with different</p>	<p>under consideration</p>	<p>Assessment of the needs based on dedicated surveys, to support technology adaptation measures and their implementation Farmers access to information and their level of knowledge on adaptation to climate change</p>	<p>to early to comment</p>		

	vegetation periods					
	Improve land management approaches and planning at local, regional and national scale towards "climate neutral" land use patterns	under consideration	review research results, promote appropriate legislation, produce guidelines for decision makers at different levels financial incentives for afforestation of degraded lands of private land owners, improve the share of forest area in poor forest regions	low capacity to manage the private sector in agriculture, , sectoral thinking, unclear ownership of land, lack of cadaster, expensive maps and databases. Lack of training programs and integration of sectors activity		
	National Action Plan on Adaptation	under development	strengthening cooperation between involved authorities			
Practices	Monitoring of meteorological parameters (160 weather stations) and agro meteorological parameters at 55 stations with agro meteorological program, for the most important agricultural crops (winter wheat, maize, sunflower, potato, fruit-trees, etc.); Research and elaboration of case-studies related to climate-change impact on agriculture and environment. Training of agro meteorology specialists in the framework of National	- under implementation	Develop the best practices guides for farmers to increase the awareness of climate change threats for agriculture; Increase the communication and feed-back level with end-users.	Limited man/hour resources and difficulties in covering with accurate observations large agricultural areas		

	School of Meteorology (NSM). Dissemination of information to end-users and decision factors.					
Technologies	Measurements at 160 meteorological stations (89 automatic and 71 classical). In-situ measurements of soil-moisture using portable dielectric probes, in platforms with the major crops (wheat, maize) where also phelological observations are performed. State of the art communication network (for data, voice, fax, e-mail, video). Use of simulation models for crop-weather relationships in order to assess the impact of climate change on yield and plant water use: CERES DSSAT, CROPWAT, HYDRUS. Use of GIS and remote sensing tools to determine spatial variability of agro meteorological parameters: (NDVI maps, thematic map layers).	- ongoing - under implementation	Continue the development of a reliable meteorological observation network including automated stations with real-time observations and a good spatial representation; Improve and develop methodologies of data collection and processing procedures (instrument calibration, data collection and storage, accuracy and quality control of observations, data flow, etc); Improve the analysis and modeling of long-term observations and agro-climatic data in order to establish the risk factors and to spot the areas with high vulnerability;			
	crop rotation, dropping	under development	specific data bases,	access to equipment	too early	

	irrigation, ferti-irrigation (Code of good practices)		validation and implementation	and specialized instalation		
Sector: water resources						
Approaches / strategies	SOP Environment - Priority Axis 5 “Implementation of adequate infrastructure of natural risk prevention in most vulnerable areas” Objectives: Contribute to a sustainable flood management in most vulnerable areas	under aproval				www.mmediu.ro
	Central and Eastern Europe Climate Change Impact and Vulnerability Assessment/	Under development	From the impact viewpoint, the most important sectors for the economies and welfare of individual region will be selected			www.mmediu.ro
	Flood Risk Management Strategy (short term)	under implementation	From the impact viewpoint, the most important sectors for the economies and welfare of individual region will be selected	A short term Investment strategy was developed and now we are under the process of rizing funds	For flood prevention, implementing the strategy , mair and prefect manuals were developed and a training programme was prepared. The flood action plan was established for preparing the population for flood management. 40 ecocenters for training children were established in schools and summer scools are	www.mmediu.ro

					planned for environment applications.	
	Drought management strategy	Under development				
	Hazard Risk Mitigation & Emergency Preparedness Project Through its components the project will: 1) strengthen and enhance the capacity of Romanian authorities to better prepare for, respond to, and recover from natural or man-made disasters, through modernization of information technology and communications systems, public awareness and preparedness, and technical feasibility work, and institutional framework for launching of the Romanian Catastrophe Insurance Program; 2) reduce flood risk and vulnerability in critical areas in Romania, to improve safety of large and small dams, in order for these to function as designed, and, to map and model the risk of landslides, so as to reduce losses,	under implementation (IBRD support) 2004-2009				

	providing better land use planning tools;					
	Ecological and economic re-shaping Programme in the Romanian sector of Danube Meadow and its financing; the Programme aims at the strategic coordination, at the level of the entire Romanian sector of Danube, of the investment works to prevent and fight floods, as well as of the future economic development measures. GD on the approval	under implementation				
	Flood Risk Management Strategy (long term)	to be prepared with PHARE assistance				
Practices	<ul style="list-style-type: none"> • Collecting, assess and make available for first local impact studies the scenarios and climate simulations; • Adaptation and development very high resolution RCMs for the region (10 km grid spacing); • Verifying the model results, compare RCM and statistical downscaling results analyze and develop 	Under development	For the quantitative estimation of the climatic change impact upon the water resources, the following steps can be taken: - the use of a general atmospheric circulation model allowing the estimation of the changes of the main climatic parameters considering certain	Short time series of hydrological data, limits of hydrological modeling using te global models results (different scales and different precisions)	The researches on other hydrographic basins located in hill and flat areas emphasise the following modifications of the hydrological cycle due to the climatic changes: - the increase of the evapotranspiration especially in the summer months due to the increase of the air temperature; - the reduction of the	www.inmh.ro/cercetare/schimbari_climatice

	<p>the methods for verification;</p> <ul style="list-style-type: none"> • Estimation the effect of global climate change on the occurrence of extreme events (heavy precipitation, heat waves, droughts) in the region; • Evaluation uncertainties in regional climate change projections; • Assessment of the impacts of climate change on the hydrological cycle and water resources over selected catchments in the region; to study the effects of climate change on the Black Sea • To study the impacts of climate change on agriculture and forestry; • To study the impacts of climate change on health and air quality;. 		<p>scenarios;</p> <ul style="list-style-type: none"> - the comparison and corroboration of the climatic model outputs with the evolution trends of the climatic parameters obtained on the basis of by processing long climatological observation series; - the use of a rainfall-runoff mathematical model applied in two cases: stationary regime and changing regime of the climatic conditions. <p>Centralized water supply of localities using the water treatment procedures for cleaning water during low flows and when rivers are polluted during floods Small plants cleaning locally water and biological treatment procedures to avoid soil and groundwater pollution.</p>		<p>depth and duration of the snow cover due to the increase of the air temperature during winter time. This will lead to the reduction of the pollution risk due to the stagnation of the pollutant agents in the snow cover;</p> <ul style="list-style-type: none"> - the reduction of the mean runoff on rivers by 10-20% due especially to the increase of the evapotranspiration; - the early occurrence of the floods and the reduction of the mixed spring floods (snow and rain) by the desynchronisation of the snow melting with the rainfall occurrence; - the decrease of the soil moisture leads to the reduction of the minimum runoff (in the summer and autumn months) fact which contributes to the increase of the pollution frequency and restrictions of the water supply. <p>The results of the researches carried out on the impact of the climatic changes on the</p>	
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					<p>water resources involve the consideration of the following aspects:</p> <ul style="list-style-type: none"> - the development of new criteria and techniques for the designing of hydraulic structures to make the water management systems more sensitive to the modifications of the hydrological regime, due to the impact of the climatic variability and climatic changes; - the elaboration of the new procedures for the operation of the water management systems to take into consideration the uncertainty of the hydrological regime evaluation, due especially to the climatic changes; - the development of researches on the impact of the climatic changes on the water quality. 	
Technologies				<p>Taking into account the monthly flow estimated as trend of demands in future for agriculture, industry and water supply under the circumstances of the</p>		

				<p>climate change, a water balance “resources-demand” model (Amaftiesei, 1988) was applied. This model allows the simulation of some storage reservoir exploitation according to some pre-established scenarios. For each time step the model applies the balance equation for each storage reservoir in the cascade from upstream to downstream.</p> <p>The application of this model results in the assessment of the vulnerability for the analysed basins: Arges River, Siret River and Târnava River.</p> <p>Taking into account the existing water management works, the climate change impact is sensitive only for the Arges River Basin, one of the most important from economico-social development and environmental issues.</p> <p>The capital of Romania - Bucharest City (about 2,000,000 inhabitants) is located within the Arges River Basin. The</p>		
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				<p>adaptation measures proposed in this basin refer to:</p> <ul style="list-style-type: none"> • Non structural measures: Newly proposed operational rules for the strategic reservoir Vidraru (live storage 420•106 m3) according to the time development of the user demands combined with a gradual reduction of the water losses in the water supply network. • Structural measures: From a certain number of reservoirs and water diversion works possible to be built in the future 15 combinations of the most economical ones have been analysed. On the basis of an economic analysis 3 sets of combinations have been selected 		
Sector: health						
Approaches / strategies						
	National Action Plan on Adaptation	under development	strengthening cooperation between involved authorities			
Practices						
Technologies						

Sector: coastal zones (settlements)						
Approaches / strategies	SOP Environment: Priority Axis 5 “Implementation of adequate infrastructure of natural risk prevention in most vulnerable areas”:Objective: ensure protection and rehabilitation of Black Sea shore	under approval				
	Master Plan and Programme for Romanian Black Sea Coast protection with the horizon timeby 2020 is . Feasibility studies are currently being prepared with JICA support.	near completion				
Practices						
Technologies						
Sector: biodiversity, environment						
Approaches / strategies	Update national forest inventory (NFI)	ongoing	NFI outputs must be integrated in the decision making system	Absence of GHG aooroach in current forest management, agriculture practices. Low understanding of the conection between NFI and GHG reporting. Institutional inconsistency in finanacial support of the NFI activities	Based on another countries, NFI is able to provide independent forest related data for the purpose of GHG inventory under UNFCC, mandatory and supplementary reporting under KP	
	National Action Plan on Adaptation	under development	strenhtening cooperation between			

			involved authorities			
Practices	aforestation of degraded lands and establishment of forest belts	under implementation				
	Develop research on the adaptability of forest species to climate change and integrate them in technical recommendations	under implementation				
Technologies	Review the ability of local population to manage the drought issues and encourage the use of traditional	under implementation				
Sector: transport, built-environment						
Approaches / strategies	adapting waterway infrastructure and management of waterways	under implementation				
	National Action Plan on Adaptation	under development	strengthening cooperation between involved authorities			
Practices						
Technologies						
Cross cutting activities						
Approaches / strategies						
Practices						
Technologies						

Slovenia						
Scope of adaptation action:						
<i>national level</i>						
Approaches / strategies	Strategies for flood and drought mitigation under National Environmental Programme (determination of risk areas, regulation of land use)	ongoing				
Practices						
Technologies						
Source: Water-Conference & EEA Questionnaire						

Spain						
Scope of adaptation action:						
<i>regional level</i>						
Approaches / strategies	Iberoamerican Programme on Impacts Assessment, Vulnerability and Adaptation to Climate Change (PIACC), in the framework of the Iberoamerican Network of Climate Change Offices (RIOCC). Reference document of the PIACC can be downloaded from: http://www.mma.es/por	ongoing under development	Strengthening of the institutional frameworks; Search for synergies with regional institutions and initiatives working on adaptation to climate change in Ibero America; Support climate and climate change research, and systematic observation; Empower exchange and availability of	One of the challenge of the PIACC is the identificaction of trans-boundary projects, trans-sectorial projects and/or pan-sectorial projects. Other importantant issues for the Programme is to promote an Outreach strategy, in order to inform and communicate the activities of the PIACC	The Programme has identified the map of priority sectors and systems in the region by means of a structured stock taking process. The report of this analysis can be downloaded from: http://www.mma.es/portal/secciones/cambio_climatico/areas_tematicas/cooperacion_cc/coop_iber/pdf/analisis_piacc	In the following website of the Spanish Ministry of the Environment (http://www.mma.es/portal/secciones/cambio_climatico/areas_tematicas/cooperacion_cc/coop_iber/piacc.htm) you can find complete information about the PIACC.

	tal/secciones/cambio_climatico/areas_tematicas/cooperacion_cc/cooperacion_iber/pdf/marco_piacc.pdf		knowledge, experiences, methods and tools to evaluate impacts, vulnerability and adaptation to climate change; Promote the development of participative projects on adaptation to climate change in priority sectors and systems	and to produce periodically evaluation reports compiling the outcomes from the PIACC on the impacts, vulnerability and adaptation to climate change in Ibero America	.pdf. Annual meetings of the RIOCC allow permanent coordination and reporting on progress, fulfilling the aim of the Network to serve as an instrument for exchanging knowledge and experiences within the Iberoamerican Climate Change Offices. Besides this, the PIACC can contribute to climate change adaptation issues within the UNFCCC framework, due to the multiple connexions between adaptation initiatives carried out under both initiatives. A strong point of the PIACC is its high level political support from all the Environmental Ministers of the region.	
Practices						
Technologies						
<i>national level</i>						
Approaches / strategies	National Adaptation Programme to Climate Change (PNACC)	ongoing	To develop elements, methods and tools in order to enhance adaptation to climate change capacity in all those public administrations, institutions and private	There are many initiatives and projects ongoing to assess climate change impacts in different sectors and systems without coordination among them; Raising awareness,	PNACC has only recently been implemented, (2006), after a wide public participatory process and a strong administrative coordination scheme,	http://www.mma.es/portal/secciones/cambio_climatico/areas_tematicas/impactos_cc/pnacc.htm

			organization with responsibility in planning and management sectors and systems potentially affected by climate change. To coordinate all those actives in the field of assessing climate change impacts. To promote participation processes among all stakeholder involved (at national, regional and local level, public or private) to establish the better adaptation options to climate change. To mainstream climate change in all activities at national, regional and local levels	Capacity building;	which provide it a strong support. Four main activities are in the First Programme of Work: generation of regional climate change for Spain, assessment of climate change impacts in water resources, assessment of climate change impacts in coastal areas and assessment of climate change impacts in the Spanish biodiversity.	
	Coordinated Programme between National and Regional Spanish Governments on Climate Change Impacts and Adaptation R&D	under development	Coordination among the National and Regional Governments in R&D issues retated to climate change impacts, vulnerability and adaptation assessment in key sectors. This initiative belongs to the general framework of the PNACC.	Coordination among all R+D groups at regional and national level is fundamental to avoid duplicated efforts.	The Programme is in its first stage	
Practices						
Technologies						

local (community) level						
Approaches / strategies	Spanish Network of Cities for Climate	ongoing and under development	Willingness of local policymakers to consider climate change as a priority in their cities.	Most of the ongoing activities of the network are focused to mitigation rather than adaptation. Local policymakers awareness need to be done in order to increase adaptation activities and mainstream them in all the activities at local level.	Outreach activities, local strategies against climate change, water save management plan in several cities are some experiences that have been carried out under this network	http://www.redciudadesclima.es/The-Network_en.html
Practices						
Technologies						
Sectoral level						
Sector: agriculture						
Approaches / strategies	Coordinated Programme between National and Regional Spanish Governments on Climate Change Impacts and Adaptation R&D	under development	Consolidate research groups into core groups and guide research activities to obtain the expected results for the policymakers: Identification, recopilation, database management; observed climate change impacts analysis; assessment of future climate change impacts; identification of the most vulnerable subsectors and geographic areas; possible adaptation options and relationship among the	Coordination among all R+D groups at regional and national level is fundamental to avoid duplicated efforts.	The Programme is in its first stage	

			sectors considered in the Coordinated Programme (Agriculture, Health, Tourism and Forest) and the different phases of the Spanish National Adaptation Programme to Climate Change (PNACC).			
Practices						
Technologies						
Sector: water resources						
Approaches / strategies	First Programme of Work of the Spanish National Adaptation Programme to Climate Change (PNACC).	under development	Coordination among this sector and the crosscutting issues of other sectors is a priority. It is also essential to share common input climate data for running the different sectoral models in the PNACC. The output data from the Climate Scenarios Development will be the input data for water resources models.	Water resources models use higher resolution than the resolution of the regional scenarios. Socioeconomic scenarios along 21st century also necessary at high resolution	The project has a strong institutional coordination which support its development	http://www.mma.es/portal/secciones/cambio_climatico/areas_tematicas/impactos_cc/pnacc.htm
Practices					Adaptation to climate change is being mainstreaming into the main planning instruments for water resources in Spain: specific references have been introduced in Technical Guidelines	

					for Water Planning in Spanish River Basins and specific consideration of climate change have been included into the Special Plans for Management of Drought in major river basin in Spain	
Technologies						
Sector: health						
Approaches / strategies	Coordinated Programme between National and Regional Spanish Governments on Climate Change Impacts and Adaptation R&D	under development	Consolidate research groups into core groups and guide research activities to obtain the expected results for the policymakers: Identification, recopilation, database management; observed climate change impacts analysis; assessment of future climate change impacts; identification of the most vulnerable subsectors and geographic areas; possible adaptation options and relationship among the sectors considered in the Coordinated Programme (Agriculture, Health, Tourism and Forest) and the different phases of the Spanish	Coordination among all R+D groups at regional and national level is fundamental to avoid duplicated efforts.	The Programme is in its first stage	

			National Adaptation Programme to Climate Change (PNACC).			
Practices						
Technologies						
Sector: coastal zones (settlements)						
Approaches / strategies	First Programme of Work of the Spanish National Adaptation Programme to Climate Change (PNACC).	under development	Coordination among this sector and the crosscutting issues of other sectors is a priority.	There are many actors at all levels (national, regional, local) involved in the planning and management of coastal areas that need strong coordination.	Many outcomes have been developed under this study, mapping the impacts in relative big segments of the Spanish coastline. Local climate change effects have to be studied taking into consideration the specificities of single locations.	http://www.mma.es/portal/secciones/cambio_climatico/areas_tematicas/impactos_cc/pnacc.htm
Practices					The Central Government with responsibility of planning and management of costas áreas (General Directorate of Coast from the Ministry of Environment) has included in its main planning instrument, the Management Director Plan for the Coast, the consideration of climate change impacts and vulnerabilities.	
Technologies						

Sector: biodiversity, environment						
Approaches / strategies	First Programme of Work of the Spanish National Adaptation Programme to Climate Change (PNACC).	under development	Connect the results in the identification of the most vulnerable habitat and taxa to climate change with the policies and measures for nature conservation in Spain, taking into account the distribution of competences and responsibilities in this field at national, regional and local levels	There are multiple pressures factors to biodiversity and climate change is only one of them		http://www.mma.es/portal/secciones/cambio_climatico/areas_tematicas/impactos_cc/pnacc.htm
Practices						
Technologies						
Sector: Forest						
Approaches / strategies	Coordinated Programme between National and Regional Spanish Governments on Climate Change Impacts and Adaptation R&D	under development	Consolidate research groups into core groups and guide research activities to obtain the expected results for the policymakers: Identification, recopilation, database management; observed climate change impacts analysis; assessment of future climate change impacts; identification of the most vulnerable subsectors and geographic areas; possible adaptation options and relationship among the sectors considered in	Coordination among all R+D groups at regional and national level is fundamental to avoid duplicated efforts.	The Programme is in its first stage	

			the Coordinated Programme (Agriculture, Health, Tourism and Forest) and the different phases of the Spanish National Adaptation Programme to Climate Change (PNACC).			
Practices						
Technologies						
Sector: Tourism						
Approaches / strategies	Coordinated Programme between National and Regional Spanish Governments on Climate Change Impacts and Adaptation R&D	under development	Consolidate research groups into core groups and guide research activities to obtain the expected results for the policymakers: Identification, recopilation, database management; observed climate change impacts analysis; assessment of future climate change impacts; identification of the most vulnerable subsectors and geographic areas; possible adaptation options and relationship among the sectors considered in the Coordinated Programme (Agriculture, Health, Tourism and Forest) and the different phases of the Spanish	Coordination among all R+D groups at regional and national level is fundamental to avoid duplicated efforts.	The Programme is in its first stage	

			National Adaptation Programme to Climate Change (PNACC).			
Practices						
Technologies						
Sector: Climate Scenario Development						
Approaches / strategies	First Programme of Work of the Spanish National Adaptation Programme to Climate Change (PNACC).		As a first step in the PNACC, it is essential the development of future climate change scenarios for Spain. Various AOGCM models and the application of different downscaling techniques to these models to obtain regional and local data which will be used as input for the impacts models of the different sectors and systems initially identified in the PNACC.	Time constrains, spatial resolution, uncertainties are some of the problems identified for this sector.	In the first stage, already finished, a collection of regional climate scenarios have been compiled and made available to the impact assessment community, and for the next stage a coordinated programme with the Spanish research community active in this field will participate in the generation of better regional climate change scenarios	www.inm.es ; http://www.mma.es/portal/secciones/cambio_climatico/areas_tematicas/impactos_cc/pnacc.htm
Practices						
Technologies						

Sweden						
Scope of adaptation action:						
<i>national level</i>						
Approaches / strategies	Survey on vulnerability of society	ongoing				
	Permit system for water users	ongoing				

Practices						
Technologies						
Source: Water-Conference & EEA Questionnaire						
Sectoral level						
Cross cutting activities						
Approaches / strategies	<p>The Commission on Climate and Vulnerability</p> <p>Internet-based adaptation Guideline</p>	<p>Commissioned by the Government the vulnerability of the society due to the climate change is investigated. The commission will calculate the costs of damage, propose actions to decrease vulnerability of the society and estimate the costs and describe the needs for organisational changes and better preparations at authorities. The commission will also analyse the needs for more research and propose legislation when needed. The commission will leave its recommendations the 1st of October 2007 and serve as a ground for a Swedish National Adaptation Strategy.</p> <p>The Swedish EPA is coordinating a joint inter-sectoral adaptation network</p>				

		<p>with the National Board of Housing, Building and Planning, the Swedish Rescue Services Agency, the Swedish Meteorological and Hydrological Institute and the Swedish Geotechnical Institute. The aim is to promote and develop the adaptation work in Sweden. In this context the agencies are developing a Internet-based Guideline for adaptation in order to stimulate the local and regional level, mainly the municipalities and CABs, in their adaptation work. The webb-site encourage the municipalities and CABs to develop local and regional adaptation strategies and to integrate the needs for adaptation in the daily work in different sectors. The webb-site will be launched in summer 2007.</p>				
Practices	Local and regional adaptation actions	In some counties and municipalities there are already an adaptation				

		work going on and measures has been taken to adapt. These counties and municipalities are often already affected by the climate change e.g. by floodings, landslides or storms.				
Technologies	Constructing barriers to protect cities against the sea, lakes and streams. Upgrading dimensions for drain and sewage system, strengthen roads and railroad embankment and bury electric cables. Ascend the lowest level for buildings in the spatial planning	Depending on municipality or county: - Ongoing - Under implementation - Under development - Under consideration				

United Kingdom						
Scope of adaptation action:						
<i>regional (sub-national) level</i>						
Practices	The 4-year ESPACE (European Spatial Planning: Adapting to Climate Events) project aims to promote awareness of the importance of adapting to climate change and to recommend that it is	Under implementation.	Input from 4 European partners to ensure best practice is shared. These then need to be communicated effectively to planners and policy makers throughout the EU	Such a multi national approach could lead to generic guidance which is difficult to apply to each member state involved. This is recognised by the project and through country level projects it	Very useful to draw on the expertise of other countries, as it challenges fundamental planning approaches due to the diversity of historical influences on each countries planning systems.	http://www.espace-project.org/ The ESPACE project will be launching the Common Transnational Strategy and Policy Guidance at a conference being held in London on

	incorporated within spatial planning mechanisms at local, regional, national and European levels. Funded by INTERREG NW Europe and UK Department for Communities and Local Government.			hopes to overcome this issue.		29th June 2007
	The BRANCH (Biodiversity Requires Adaptation in Northwest under a CHanging climate) project advocates change to the spatial planning and land use systems to allow wildlife to adapt to climate change, demonstrating the need for change based on science, and recommending policies and tools to be developed in collaboration with planners. BRANCH is funded by INTERREG NW Europe.	Under implementation - completion: September 2007.	Embedding of conclusions and recommendations of BRANCH project into planning policy at European, national, regional and local levels. Implementation of policies and mechanisms already available to planners to increase biodiversity's robustness to climate change.	Lack of understanding and mechanisms within planning community to implement policies which will conserve biodiversity in the future. Timescales in planning decisions are not in tune with climate change timescales.	Planners require clear, implementable, prioritised recommendations. The importance of biodiversity can be promoted through its wider benefits to society.	www.branchproject.org.uk
<i>national level</i>						
Approaches / strategies	Adaptation Policy Framework (APF). Co-ordination of adaptation activities across UK Government,	Under development.	This is a cross-Government framework for incorporating adaptation into climate-sensitive policies and	That climate change is viewed as an environmental (as opposed to cross-sectoral) issue by other Departments - although	Phase 1 public consultation of APF ended in 2006. A second phase of consultation, based on analysis of activities	http://www.defra.gov.uk/environment/climatechange/uk/adapt/policyframe.htm Pages 132-133 of UK Climate Change

	<p>involving: comprehensive coverage of sectors; coherent approach across departments, levels of government, and wider public sector; provision of strategic direction, without duplication of existing efforts; definition of roles and responsibilities; provision of sound evidence base for decision-making; identification of threats and opportunities.</p>		<p>plans, and therefore buy-in from officials and ministers in all Departments across Government is essential for delivery. Sufficient staff and other resources are necessary to manage the time-consuming process of arranging meetings, facilitating cross-Departmental discussions, publishing reports, etc.</p>	<p>this is an increasingly outmoded view in UK Government. That appropriate and proportionate resources are not targeted towards ensuring climate-sensitive areas are adapted. Climate change will change the type and severity of impacts which we should plan to respond to. The normal approach for contingency planning in the UK is to adopt an all-hazards approach and prepare a response which is flexible and can be ramped up, if necessary. However, not all planners would be able to claim that they had an understanding of how climate change may pose problems. All levels of Government (and all Departments) need to factor-in the possible changes which climate change could bring about in respect of contingency planning but that is easy to say and much more of a challenge in practice. The</p>	<p>taking place and an assessment made of the reasons why some sectors are adapting more successfully than others, will be launched in 2007. A third phase, based on identification of areas where adaptation is not occurring and what incentives and assistance may be required to ensure that it is considered appropriately in future planning and development, will be launched in 2008, to complete the APF work.</p>	<p>Programme 2006: http://www.defra.gov.uk/environment/climatechange/uk/ukccp/pdf/ukccp06-all.pdf</p>
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				Adaptation Policy Framework will help to address this.		
	<p>UK Climate Impacts Programme. Set up in 1997 and funded by the UK Department for Environment, Food and Rural Affairs (DEFRA), UKCIP helps organisations assess how they might be affected by climate change, so they can prepare for its impact. Based at the University of Oxford, UKCIP works with stakeholders/partners and co-ordinates research - based on the stakeholder's needs - on how climate change will have an impact on their activities, and ways in which they can adapt to minimise these impacts. UKCIP provides a bridge between researchers and decision-makers in government organisations and business.</p>	Under implementation.	<p>Although UKCIP doesn't implement adaptation actions (but provides informed advice), many organisations have and continue to use this resource, so sufficient staff and financial resources are required to maintain a high level of service. Furthermore, the tool-kit needs to be regularly updated and improved, in line with scientific developments - for example, the next set of UK climate change scenarios, which will involve extensive climate modelling activity at the UK Met Office (Hadley Centre). UKCIP aims to bridge the gap between research and policy so that decisionmakers take control to produce research in ways that are useful to them. The Programme has been flexible and was developed incrementally, with</p>		<p>The approach taken should be consistent with the governance and political culture, and build on/emphasize priority drivers/levers of change. The Programme's results suggest that if decision makers are supported, capacity is built for assessments, and crucially, research outputs are directly applicable to their ongoing work and strategic planning. This capacity-building has worked across scales and sectors and is an effective route to mainstreaming climate change adaptation. The implication, therefore, is that more support should be given by funding agencies to develop institutional capacity to support adaptation to climate change in both the private and public sectors. (see Hedger, Connell and Bramwell, 2006, Bridging the gap: empowering decision-</p>	<p>www.ukcip.org.uk for list of publications, etc.</p>

			increased scientific understanding, taking advantage of collaborative funding and facilitating long-standing partnerships. Whilst the core framework of scenarios and other tools, methods and guidance has been developed centrally, most studies have been stakeholder-funded and led.		making for adaptation through the UK Climate Impacts Programme, Climate Policy, Vol 6)	
	Implications of Climate Change for Defra	Under implementation/complete.	Resources at Directorate/Divisional level, to address adaptation measures necessary within climate-sensitive areas of business.	That appropriate and proportionate resources are not targeted towards ensuring climate-sensitive areas are adapted.	It is important to ensure that report publication isn't viewed as the final step, and that the converse is true: the report serves as a first step towards obtaining a better idea of the impacts of climate change on areas of Departmental business, and implementing adaptation measures to mitigate potentially unacceptable impacts. It's very important to maintain momentum beyond report publication.	Report 'The Impacts of Climate Change: Implications for Defra': http://www.defra.gov.uk/environment/climatechange/pubs/impacts/index.htm
	Nottingham Declaration on Climate Change and Scotland's Climate Change Declaration	Ongoing with continued efforts to have all local councils to become signatories.	Both contain a commitment for the local councils to develop plans that both address the causes of, and risks/opportunities	The efforts to date have been primarily bottom-up although signatories to the declarations do include central government/devolved	Support from central government/devolved administration executive is essential for continued success as is a supportive set of	http://www.sustainable-scotland.net/climatechange/ ; and www.nottinghamdeclaration.org.uk

			associated with climate change. Also included is an effort to monitor and communicate the results of efforts	administration executive signatories. A consistent and achievable set of targets and indicators for adaptation will be needed to monitor and report on the effectiveness of the various plans.	guidance (e.g., Nottingham Declaration Action Pack).	
	UK Department of Work and Pensions (DWP): climate change adaptation	Under development.	The paper is in its infancy and being developed in conjunction with the Hadley Centre (Met Office). The intention is to produce a document with an overlay of scientific input, describing what climate change effects will have on the DWP and its business delivery. Adaptation plans can then be formulated.	None yet.	None yet.	None yet.
	Effects of Climate Change on Fire and Rescue Services in the UK	Published research report.	N/A	N/A	Fire & rescue services should begin to plan for climate change. Climate change will make existing challenges more severe and more frequent, but is unlikely to provide new challenges.	http://www.communities.gov.uk/index.asp?id=1505324
	Responding to our Changing Climate - a consultation on an action plan to adapt to	Under development - currently out to consultation.				http://new.wales.gov.uk/consultations/currentconsultation/envandcouncurrcons/1252231/?1

	climate change in Wales					ang=en
	Trade Association Climate Change Declaration - includes a commitment to action on both adaptation and mitigation	Under development.	Buy on by trade associations and a mechanism to monitor and review actions and continued relevance	The acceptance of the specifics of the commitment by a broad range of trade associations	Need for engagement of a variety of trade associations in the development of the declarations and the associated terms and conditions that come with signing on to the declaration	
	Environment Agency National Adaptation Strategy - which seeks to integrate climate change consideration into the entire business	Under implementation.	Acceptance for the need of such a process at all levels, and then resource to apply it. Once this acceptance has been gained to progress the issue further it is essential to be able to have examples of impacts or financial/social costs of inaction to justify the need for change. Case studies at a suitable level are invaluable.	Climate adaptation, when tackled at a generic national level is very difficult to engage stakeholders with as required changes on the ground to operational practice are often site specific and difficult to generalise.	Need to be open about the timescales and uncertainty involved and build on the opportunities for incorporating adaptation actions at little or no extra cost.	Copy of the strategy available from roger.hoare@environment-agency.gov.uk
	Preparing for a Changing Climate in Northern Ireland This report examined the impacts of climate change and identified the threats and opportunities together with the adaptive strategies required over 13 different sectors.	Under implementation.	Commitment, resourcing and collaboration - sub-national governments, business and industry, and the support of those who should be considering their risks, vulnerabilities and needs with respect to adaptation.	Lack of data in some sectors. Further research needed		Further details of the adaptation report are available on the DOENI web site (www.doeni.gov.uk) and also on www.sniffer.org.uk under project code UKCC13
Practices	BRANCH research report: Spatial planning	Under implementation.	Existing tools and mechanisms			http://www.branchproject.org/available/repor

	for biodiversity in our changing climate		highlighted in report to be implemented by planners.			tsandpublications/ENRR677Spatialplanningforbiodiversityinourchangingclimate.pdf
	UK climate change partnerships	Under implementation.	Commitment, resourcing and collaboration - sub-national governments, business and industry, and the support of those who should be considering their risks, vulnerabilities and needs with respect to adaptation.	The ability to mobilise sufficient resources including that for a full-time regional coordinator can limit the scope and effectiveness of the regional partnerships.	The hiring of a full-time coordinator has enhanced the scope of activities, the integration of adaptation into associated policies/strategies and the introduction of adaptation measures.	Further details on these partnership are available through the UKCIP web site (www.ukcip.org.uk) where there are also links to the websites with further information. Example: London Climate Change Partnership - www.london.gov.uk/climatechangepartnership/aims.jsp www.london.gov.uk/climatechangepartnership/adapting-jul06.jsp
	National Planning Policy Statements (PPS) and code for sustainable homes	Ongoing. Planning Policy Statement 25 (PPS25) sets out Government policy on development and flood risk. It's aims are to ensure that flood risk (incorporating climate change projections, such as mean sea-level rise) is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding, and to direct development	See various entries on sectoral spreadsheet, in "Sector: transport, built-environment" section.	See various entries on sectoral spreadsheet, in "Sector: transport, built-environment" section.	See various entries on sectoral spreadsheet, in "Sector: transport, built-environment" section.	http://www.communities.gov.uk/index.asp?id=1143803

		away from areas of highest risk. Where a new development is, exceptionally, necessary in such areas, the policy aims to make it safe, without increasing flood risk elsewhere, and, where possible, reducing flood risk overall. The Department for Communities and Local Government (DCLG) lead the process of developing planning guidelines and statements.				
	Environment Agency flood guidance. Around 5 million people, in 2 million properties, live in flood risk areas in England and Wales. The Environment Agency has an important role in warning people about the risk of flooding in England and Wales, and in reducing the likelihood of flooding from rivers and the sea.	Under implementation.				http://www.environment-agency.gov.uk/subjects/flood/1217883/?version=1&lang=_e
	Impact of Climate Change on UK energy Sector - scoping study of potential components of demand, production	Under development. Scoping study completed by UK Met Office consultancy wing. Phase 2 involves designing research to				http://www.metoffice.gov.uk/consulting/casestudies/index.html

	and distribution that may change in future climate	underpin adaptation choices prioritised in scoping study.				
	As part of BRANCH project, modelling of coastal vulnerability.	Complete.		Need to recognise importance of policy integration to reduce pressures on biodiversity; we need a national climate change adaptation strategy that addresses the needs of biodiversity. We lack a national ecological network approach. Also difficult to engage with national departments and planning sector.	Would be good to have a priority list when it comes to biodiversity; we cannot have all we ask for due to pressures from other sectors (e.g. development).	www.branchproject.org
Technologies	Nottingham Declaration Action Pack (NDAP) - a one stop web based action pack which draws together guidance and tools to aid both mitigation and adaptation work	Under implementation.	Uptake by Local Authorities, national targets recognise NDAP role and the two are integrated. Actions linked to delivering change rather than 'green wash'. It also needs all key partners to be involved to ensure suitable information is available.	Current lack of sufficient resource put towards climate change adaptation within local authorities.	A lot of appetite currently for action to be taken but this is often not backed up by allocation of resource at an application level.	www.nottinghamdeclaration.co.uk
	Environment Agency on-line, searchable flood risk map. Gives detail of what areas are most likely to be affected by flooding when waters rise, throughout England					http://www.environment-agency.gov.uk/subjects/flood/?lang=_e

	and Wales. Searches (free) can be by post-code or town.					
local (community) level						
Approaches / strategies	Environment Agency of England and Wales is developing regional climate change strategies for each of its English Regions and Wales.	Under development.	Cross sector working in water resource management, flood risk, land quality and conservation. Organisational change to incorporate adaptation actions into business planning and operational practice, plus communications strategy for internal and external audiences.	Adaptation actions are not fully integrated into business planning and operational practice. Some sector specialists still regard climate change as an 'add-on' rather than a core part of future work planning.	Proactive communications backed up by sound science programmes to provide the evidence base can make the objective case for implementation of adaptation policies	N/A
Practices	UKCIP Adaptation Actions database. Information on adaptation approaches and practices has been assembled by the UK Climate Impacts Programme in its Adaptation Actions database. This database is comprised of more than 300 adaptation strategies and measures implemented and under development by a variety of organisations within the UK. The Adaptation Actions database is searchable by sector, adaptation	Under implementation.	Depends upon resources of organisations accessing the database, and applicability of previous adaptation actions to other settings.	Entries in the database and its currency depend on submissions by those undertaking the adaptation which is partially determined by the value potential contributors see in adding to the database.	Database just launched, so too early to say.	http://www.ukcip.org.uk/resources/tools/database.asp

	<p>activity (i.e. building adaptive capacity, delivering adaptation actions and then further subdivided into the various types of adaptation) and region within the UK. For most of the entries in this database, in addition to a brief description there is a web site address through which more details can be sought. Most of the adaptation approaches listed within the UK submission are contained within the UKCIP Adaptation Actions database.</p>					
	<p>A UKCIP Local Climate Impacts Profile is a resource for Local Authorities and other locally based organisations such as those in a Local Strategic Partnership. It collates information on recent and current severe weather events from local media sources and records their impacts on a locality (flooding, damage to property, disruption to transport</p>	<p>Under implementation (e.g. at Oxfordshire County Council). The profile should be continually updated with information on severe weather events, details of the weather and more qualitative information about the nature of the organisational responses, whether it was felt to be adequate, whether any immediate adaptation measures were taken, whether</p>	<p>Commitment by a local authority to undertake the exercise and communication to officer staff at all levels that such an exercise is happening and that they may be contacted and asked to respond and give information and comment. Important to secure senior Officer support to continue beyond the initial data collection stage.</p>	<p>A Local Climate Impacts Profile helps to start a process of organisational review, concerns might be that it is shelved halfway through or that the information is not followed up and used to inform on-going decision-making.</p>	<p>The process of compiling a Local Climate Impacts Profile is very helpful in creating awareness amongst Council Officers and Politicians of the kind of issues the organisation may face in responding to changes in weather and particularly in response to severe weather events. It also allows staff to reflect on their operational response and weaknesses</p>	<p>A Local Climate Impacts Profile guidance brochures from UKCIP, www.ukcip.org.uk Oxfordshire County Council work www.oxfordshire.gov.uk</p>

	<p>etc) and provides a context for analysis of future climate scenarios and the possible consequences for a locality.</p> <p>Understanding vulnerabilities to current extreme weather events, the impacts of those events and the preparedness of the organisation and its ability to respond and cope helps an organisation to understand what kinds of adaptation measures will be necessary.</p>	<p>any immediate adaptation measures are identified and what kinds of preparations are necessary for the future. It is possible for service delivery personnel to use this information to determine the point - the critical threshold - when the service delivery is disrupted, either by temperature or another weather variable. Once the critical threshold is understood and an understanding of the likelihood or probability that the weather conditions that cause thresholds to be reached or exceeded is understood then informed adaptation or preparation can follow.</p>			<p>therein, i.e. lack of consistent monitoring and to consider what strategic or forward planning actions might be necessary.</p>	
	<p>As part of the BRANCH project, modelling the effects of sea-level rise at coastal case study sites in Hampshire, Dorset and Isle of Wight; modelling species movement in Hampshire and Kent.</p>	<p>Under implementation, being discussed with stakeholders.</p>	<p>Need better provision of guidance on 'green' infrastructure in UK regional plans and policies.</p>	<p>Lack of national guidance and leadership on planning space for nature. Planners are concerned about lack of evidence to back up recommendations and decisions e.g. reserving land for the future, especially in public enquiries. Plans do not</p>	<p>We need to empower local level planners to make their plans climate-change-robust by providing them with good evidence and clear guidance, ideally this should come from national level. We have had some success getting climate change adaptation recognised</p>	<p>www.branchproject.org</p>

				always sit in context with other regions. Climate change doesn't recognise borders, so need to work cross-regionally to find solutions.	in regional spatial plan, but clearer recommendations are still needed.	
	Feeding BRANCH recommendations into South East Regional Spatial Strategy	Completed during South East plan.	Need better provision of guidance on 'green' infrastructure in UK regional plans and policies	Lack of national guidance and leadership on planning space for nature. Planners are concerned about lack of evidence to back up recommendations and decisions e.g. reserving land for the future, especially in public enquiries. Plans do not always sit in context with other regions. Climate change doesn't recognise borders, so need to work cross-regionally to find solutions.	We need to empower local level planners to make their plans climate-change-robust by providing them with good evidence and clear guidance, ideally this should come from national level. We have had some success getting climate change adaptation recognised in regional spatial plan, but clearer recommendations are still needed.	http://www.southeast-ra.gov.uk/southeastplan/
	Environment Agency River Wear Catchment Adaptation Study	Under consideration.	Lessons from study need to be taken up by key stakeholders.	Danger of it being just another study. Benefit of this work was that it considered specific significant sites/buildings in the catchment which would hopefully make uptake easier for those considered.	This review which considered adaptation needs throughout a river catchment is being taken on throughout the north east region.	http://www.environment-agency.gov.uk/news/1696408?region=North east&
	Tyndall Centre Research Theme 3: Adapting to Climate	Under implementation.	Continued financial support for the Tyndall Centre (by NERC and			http://www.tyndall.ac.uk/research/theme3/theme3_project_list.sht

	Change Although international in coverage (and not necessarily applied specifically to the UK context) the research outputs can inform adaptation policy and practice in the UK.		others).			ml
Technologies	Environment Agency: Flood Ranger - computer simulation tool	Under implementation.	Access to CD - training tool to help planners understand the implications of their planning actions. Virtual world created which then allows you to simulate certain climate change scenarios	Theoretical tool that is not specific to any particular area. New version available which simulates flood impacts on the Thames Estuary	Valuable training tool to get key messages to planning staff	http://www.espace-project.org/
Sectoral level						
Sector: agriculture						
Approaches / strategies	UK DEFRA Sustainable Agriculture Climate Change Adaptation Research Programme. To initiate preparation of alternative agriculture options and other response measures, including alternative crops, cultivation methods and pest, weed and disease controls.	Under implementation.	Adequate resources to take forward recommendations of research programme and need to ensure research results are communicated effectively, in order to lead to concrete action on adaptation by farmers and land managers.	Knowledge transfer, limited incentives for farmers.	Effective dissemination of research results is essential.	http://defrafarmingandfoodscience.csl.gov.uk/ Research pre-2003: Defra Climate Change Impacts & Adaptations Research Programme (CC03) Project Summaries Report 1987 – 2003 https://intranet.rac.ac.uk/course-ird/sink_swim/CC03_Summaries%20of%20Research_2003.PDF

						<p>The summary includes research:</p> <p>Identifying And Costing Agricultural Adaptive Under Climate Change Scenarios (ICARUS); Assessing Drought Risks For UK Crops Under Climate Change; Maintaining Wheat Performance Through Improved Resistance To Drought; To Investigate The Likely Impact On Crop Development Of Changes In Temperature And Water Associated With Global Warming; Publication Of The Review Of The Direct Effects Of The Dry Hot Summer Of 1995 On Decision Making Of The Individual Farmer; Review Of The Direct Effects Of The Dry Hot Summer Of 1995 On Decision Making Of The Individual Farmer; On-Farm Water Conservation; The Effect Of Future Climatic Change On</p>
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						<p>Agricultural Potential; To Develop Grasses Likely To Tolerate Climate Change; The timescale of potential farm level responses and adaptations to climate change in England and Wales</p> <p>Current, ongoing research:</p> <p>Vulnerability of UK agriculture to extreme events</p> <p>http://www2.defra.gov.uk/research/Project_Data/More.asp?I=AC0301&M=CFO&V=WHRI</p> <p>Changes to agricultural management under extreme events – likelihood of effects and opportunities nationally (chameleon)</p> <p>http://www2.defra.gov.uk/research/project_data/More.asp?I=CC0361&M=KWS&V=cc03&SUBMIT1=Search&SCOPE=0</p> <p>The Defra Climate Change Research and Innovation Adaptation Network</p>
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						http://www2.defra.gov.uk/research/project_data/More.asp?I=AC0302&M=KWS&V=AC0302&SCOPE=0
	Rural Climate Change Forum - the RCCF is a stakeholder Forum, co-chair by DEFRA minister Ian Pearson and launched in March 2005. It provides advice on climate change and rural land management, including on adaptation and managing the impacts of climate change. The RCCF secretariat is based at DEFRA and the group meets 3-4 times a year.	Under implementation.	Need to ensure that the RCCF has access to robust information about adaptation in order to make sound recommendations. Top level engagement important, as it means that the messages RCCF participants take away are then filtered into their organisations from the top down (and it allows for valuable discussions at the meetings themselves). Continued involvement of minister as a co-chair helps to make sure we continue to get high level engagement. RCCF also adds value by joining up different parts of the agenda (e.g. the important links between action on mitigation and climate change, the need to make sure that policy and research are properly communicated).	Each organisation has their own agenda. That's often helpful and doesn't have to be a barrier, but some organisations approach adaptation with very different perspectives.	Site visits have provided a good backdrop for productive discussions and helped to get the members focused on how best to put things into practice on the ground.	Summary of RCCF, including Terms of Reference: http://www.defra.gov.uk/environment/climatechange/uk/agriculture/rccf/index.htm
	Strategic review of the	Initial review has been	Developed	Cross-sectoral issues	Very difficult to	www.environment-

	impacts of climate change on land management in England & Wales conducted by the Environment Agency.	completed and an Action Plan has been produced to help guide Environment Agency work in this area to aid the incorporation of adaptive action.	understanding through research and partnership working.	are particularly relevant for agriculture. Biodiversity, flood risk management and market changes all affect sectoral impact and ability to adapt to climate change. It is therefore essential that a review of adaptive options is linked into the needs and responses of other sectors.	develop a full understanding of the impacts the sector faces. However it is important to begin engagement at the earliest opportunity and to identify opportunities to build in no-regret adaptive actions which entail no excessive cost and facilitate future adaptation.	agency.gov.uk
	Agri-environment schemes and the Environmental Stewardship scheme (launched March 2005).	Under implementation.	Regular review of management prescriptions and payments render them potentially well-suited to adapt to the changing climatic and socio-economic conditions. However the policy assumes farmers will adopt it voluntarily. Continuation of these policies depends on positive attitudes towards environmental protection and farming and proven success in enhancing biodiversity.	That their role will be undervalued, that their funding will be cut following new initiatives for things like biofuels/bioenergy and their impact will diminish.	Agri-environment schemes in general have the potential to enhance the performance of other policies through components which seek or need to act at landscape scales. After some modification, targeted agri-environment schemes could help develop landscape-level planning and in this way would contribute to maintaining the resilience of all the other policies discussed here.	http://www.defra.gov.uk/erdp/schemes/default.htm Some of this information has been drawn from an Environment Agency/Countryside Council Wales research project looking into Climate Impacts on the Rural Economy. The results of this project will be launched in June 2007. More information will be available from www.environment-agency.gov.uk Agri-Environment Schemes review: http://www.defra.gov.uk/erdp/reviews/agrien

						v/default.htm Environmental Stewardship: http://www.defra.gov.uk/erdp/schemes/es/default.htm
Practices	Agricultural Change and Environment Observatory (funded by DEFRA and others) provides evidence for policy making on the range of environmental issues for agriculture. One of the aims of ACEO is to look at the links between the changes observed in farming practices and observed environmental changes, including adaptation to climate change. Farmers' Voice survey 2006 (part of ACEO research programme) includes a chapter on adaptations as a result of climate change.	Under implementation.		Still fairly young in its creation - it was launched in 2005 to look predominantly at the impact of 2003 CAP reform.	Still fairly young in its creation - it was launched in 2005 to look predominantly at the impact of 2003 CAP reform.	http://www.defra.gov.uk/farm/policy/observatory/index.htm ; Agricultural Change and Environment Observatory Programme Annual Review: http://www.defra.gov.uk/farm/policy/observatory/annualreview.htm . Climate change adaptation pages of Farmers' Voice 2006 survey: http://www.defra.gov.uk/farm/policy/observatory/research/pdf/farmersvoice2006.pdf pages vi-vii
	Vale of Evesham Project - specifically examining the impact of an extreme weather event (heatwave of 2003) on farms in the Vale of Evesham and the measures that farmers took in	Under consideration.	Support for farmers to undertake adaptation actions, to ensure they are aware of the potential impacts that will affect their work. Includes the wider land-management community such as	No suitable tools for them to develop their adaptive responses. National tools are academic and generic. Sector-specific, simplified versions required with clear case studies provided	When not in job description or immediate interest of group involved, very hard to engage over the long term. Short-term economic pressures dominate decision making. The need for a	http://www.sustainabilitywestmidlands.org.uk

	response.		land-owners and suppliers who also need to be engaged by this process.	at a local level. Cost benefit considerations need to be incorporated throughout.	sector co-ordinator was key to bringing stakeholders together and to facilitate discussion.	
Sector: water resources						
Approaches / strategies	Environment Agency strategy 'Water resources for the future: a water resources strategy for England and Wales' (and planned strategy revision in 2008).	Under implementation.	Widespread take-up of the 25 year strategy groups and individuals.			http://www.environment-agency.gov.uk/subjects/waterres/137651/?version=1&lang=_e
	Environment Agency: Influencing long term water resource planning through 4th Periodic Review (PR04) of water companies.	Under implementation.	Buy-in of water companies.			http://www.environment-agency.gov.uk/commodata/acrobat/schemeassessmentv7_784388.pdf
	Environment Agency: A coherent framework for water planning under climate change.	Under implementation - due to be completed April 2007.	This project will collate latest scientific evidence of projected climate change impacts on surface and groundwater resources and appraise the methodologies being developed by a raft of national projects. The project will deliver prototype guidance on behalf of the water resources function on how to factor climate change into water company plans ahead	Uncertainty in climate predictions has limited the uptake of climate risk into long-term water resource planning. This guidance aims to overcome that issue and enable greater confidence in building in system resilience. Engagement of the water industry and their involvement in the research will help ensure they are willing to use the final output.	From some of the supporting science it has become evident that the climate change signal will not appear above natural variation for precipitation until the 2030s. Therefore much of the resilience work required to that point should centre around planning for current natural extremes.	Wilby, R.L. 2006. When and where might climate change be detectable in UK river flows? Geophysical Research Letters. Environment Agency, 2006. Major Droughts in England and Wales from 1800 and evidence of impact. Environment Agency Science Report SR040068 - Part 1, Bristol pp53

			of the statutory water resources plans that will also form part of water companies' submissions for PR09.			
Practices	Thames Estuary 2100. Project to look at potential river and storm surge floods that could affect Thames barrier by 2100.	Under implementation (joint project Met Office and Environment Agency).	Study will inform strategic decisions regarding increasing height of Thames Barrier. Resources, therefore, to make recommended modifications.			http://www.te2100.dialoguebydesign.net/dbyd.asp
	UK Water Industry Research (UKWIR) project to examine impact of future projections of rainfall on UK sewage systems design and capability of existing system to cope.	Study complete.				http://www.metoffice.gov.uk/consulting/casestudies/index.html Reports can be ordered from the UKWIR website www.ukwir.org
	UKWIR project CL/10: Climate Change And The Design of Sewerage Systems	Under consideration.	UK water companies will need permission from regulator to implement recommendations, if extra cost would be incurred.	UKWIR not a statutory body, so no obligation on water companies to implement recommendations.		Reports can be ordered from the UKWIR website www.ukwir.org
	Water company Water Resource Management Plans; impacts of climate change to be factored into estimates of supply & demand.	Under implementation.	Plans produced 5-yearly.	Water company concerns about availability of information for the plans. Need for timely updates to scenarios of impacts of climate change.		http://www.environment-agency.gov.uk/subjects/waterres/981441/?version=1&lang=_e
	EA Catchment Abstraction	Under implementation.	Produced on 6-yearly cycle.	Need for timely updates to scenarios of		http://www.environment-

	Management Strategies - taking account of climate change and influencing future allocation.			impacts of climate change.		agency.gov.uk/subjects/waterres/1341275/564321/309477/?lang=_e
	Water company Drought Plans.	Under implementation.	Produced on 3-yearly cycle, and will use assumptions in the water resources management plans.	Action not taken early enough in response to threat to the security of water supply.		http://www.environment-agency.gov.uk/subjects/waterres/1014767/1370506/1401682/?version=1&lang=_e
	In Wales: water companies are required to prepare water resources management plans that will take full consideration of the likely impacts of climate change. Work will commence in developing new water resource management plans in 2007, and will be informed by the UK research into climate change impacts that has developed in recent years.	Under development.				
	Welsh Health Estates, through the Welsh Health Environmental Forum, is promoting water conservation and water metering along with grey water recycling in National Health Service premises. To improve the resilience of water	Under implementation				

	supplies in the event of interruption water is stored on site and there are facilities in place to allow water bowsers, operated by the local water company, to be used to re-supply hospital storage tanks.					
Technologies	Environment Agency: Flood Ranger - computer simulation tool.	Under implementation.	Access to CD - training tool to help planners understand the implications of their planning actions. Virtual world created which then allows you to simulate certain climate change scenarios.	Theoretical tool that is not specific to any particular area. New version available which simulates flood impacts on the Thames Estuary.	Valuable training tool to get key messages to planning staff.	http://www.espace-project.org/
Sector: health						
Approaches / strategies	National Heatwave Plan. Spells out what needs to be done by health and social care services and other bodies to raise awareness of risks relating to severe hot weather and what preparations both individuals and organisations should make to reduce those risks. The plan also details the responsibilities at national and local level for alerting people once	Under implementation.				National Heatwave Plan and all supporting information, including advice for health and social care professionals, care-home managers and staff: http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4135296

	a heatwave has been forecast, and advising them what to do during a heatwave.					
	The UK Department of Health report Health Effects of Climate Change in the UK, 2001 is currently being reviewed.	Under development.	Stakeholder input. Recent national workshops have been jointly organised by the Department of Health, DEFRA, the Environment Agency, the Health Protection Agency and the Sustainable Development Commission, aimed specifically at addressing Climate Change and Health (including focus on health effects of flooding), on People, Places and Health (with climate change influences recognised including forced migration); Chemicals and Health, (including concerns about raised ozone levels in hot weather), and Food and Health (including sustainability of food stocks which may also be influenced by climate change effects on the supply chain).			www.dh.gov.uk/PolicyAndGuidance/HealthAndSocialCareTopics/AirPollution/AirPollutionGeneralInformation/fs/en
	The UK Government's Choosing Health white	Under implementation.				www.dh.gov.uk www.lho.org.uk/view

	<p>paper requires the National Health Service (NHS) to act as a good corporate citizen. In addition, the 'Building for Health' toolkit allows Primary Care Trusts and NHS Trusts to build sustainability into the process to procure new health care facilities</p>					<p>Resource.aspx?id=10703</p>
	<p>All NHS Trusts in the North West region have been asked to sign up to the North West Climate Change Charter by the Regional Director of Public Health. A wide range of initiatives related to sustainability/climate change are underway across the NW region as part of a collaborative programme of Corporate Social Responsibility - a programme involving the NHS and the North-West Regional Development Agency. One strand in this initiative has been an EU regions project which has defined the Bilbao Agenda.</p>	<p>Under implementation.</p>				<p>www.snw.org.uk www.healthcluster.net.org</p>

	<p>The health sector is working at a regional and local level to mitigate and adapt to the projected impacts of climate change.</p> <p>Key areas:</p> <ul style="list-style-type: none"> • Adapting the healthcare and social care infrastructure (hospitals, nursing homes) to be more resilient to the effects of heat, gales and floods. • Improved systems for forecasting severe gales, floods and heatwaves. • Developing plans for coping with disasters. • Increasing understanding of how people can adapt to changes in climate. • Improving design of urban environments. <p>Examples:</p> <ul style="list-style-type: none"> • Including text in PFI/PPP building contracts to ensure future changes in climate are taken into account in designing hospitals, for example with better shading and less glass (requires research by heat engineers and NHS 	Under implementation.	This work requires a multi-sectoral approach and bringing people together to work on common themes has proved essential.			<p>The cross sectoral development and use of a sustainability/integrated impact assessment (including climate change issues) has been used in NHS capital developments community plans and other health sector developments. This guidance has been featured in Health Development Agency (HDA) guidance on 'clarifying impact assessment'.</p> <p>HDA (2005) Clarifying Approaches to Health Needs Assessment, Integrated Impact Assessment, Health Equity Audit, Race Equality Impact Assessment (www.hda.nhs.uk, www.nice.org.uk)</p>
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	<p>Architects).</p> <ul style="list-style-type: none"> • Ensuring building regulations take account of future climate change and are linked to 'weather years' data from the Chartered Institute of Building Services Engineers. • Design of drains to cope with increased intensity of rainfall. • Ensuring hospitals have 'Gale Plans' and 'Flood Plans' as well as 'Heatwave Plans' for the immediate and longer term. 					
Sector: coastal zones (settlements) and marine						
Approaches / strategies	<p>Marine Climate Change Impacts Partnership (MCCIP) The key objectives for the MCCIP: To develop and maintain a coordinating framework for marine partners in the UK. To build the knowledge base and create effective mechanisms for the efficient transfer of marine climate change knowledge from the scientific community to policy advisers and decision</p>	Under implementation.				www.mccip.org.uk

	<p>makers. To facilitate uptake of tools and strategies to assist stakeholders in developing and assessing adaptation strategies.</p>					
	<p>Marine Bill (proposed national legislation) will propose a flexible way for the marine environment to be managed, mindful of the increasing pressures on our seas, growing demand for marine space from the expansion of traditional activities, and emergence of new technologies. The approach suggested factors in the need to adapt to the impacts of climate change on our seas and recognises the contribution that the marine area can make to meet this challenge. Overall, the focus of the draft Bill is the management of pressures - human and environmental - on the marine environment.</p>	<p>Under development. White Paper was released for consultation in March 2007.</p>	<p>Sufficient buy-in from stakeholders. Confidence in climate change scenarios from a decision-makers perspective.</p>	<p>Too early to say.</p>	<p>Too early to say.</p>	<p>http://www.defra.gov.uk/corporate/consult/marinebill-whitepaper07/marinebill-whitepaper.pdf</p>
	<p>In Wales, the Welsh Assembly Government and its partners, are developing a Coastal</p>	<p>Under development (consultation just closed)</p>				<p>http://new.wales.gov.uk/topics/tourism/news/1314056?lang=en</p>

	Tourism Strategy which will take into account climate change and coastal erosion impacts.					
	Environment Agency Catchment Flood Risk Management Plans (CFMPs)	Under implementation.	Catchment Flood Management Plans will be the cornerstone of our Flood Risk Management Strategy and our new strategic, proactive approach to managing and reducing flood risk. They identify long-term, sustainable policies for flood risk management throughout a river catchment. We have dedicated teams developing the individual CFMPs throughout England and Wales.			Example of CFMP in Anglian region - www.environment-agency.gov.uk/regions/anglian/1109713/?lang=_e
	Thames Estuary 2100	Under implementation.	Development of a plan for flood risk management for the tidal Thames	Very large investment required	Adaptation is best started as early as possible to combat the resistance for change engendered in many organisations.	www.environment-agency.gov.uk
Practices	Planning Policy Guidance 20: Coastal Planning	Under implementation.	Coastal erosion maps to feed into planning system (under development).	Lack of data.	Conflicting timescales of planning guidance and Local Development Documents. Maintaining vibrancy of coastal communities under threat.	http://www.communities.gov.uk/index.asp?id=1144093
	Planning Policy	Under implementation.	New Guidance for	Development needs		www.communities.gov.uk

	Statement 25		Spatial Planners to consider flood risk both present and future	may overpower future flood risk concerns under climate change		v.uk/index.asp?id=1504639
	Environment Agency Flood and Coastal Defence Appraisal Guidance - Climate change impacts allowances	Under Implementation.	Sufficient funding is required to enable the recommendations in the guidance to be incorporated.	Allowance not site-specific for river flooding (20% increase nationally), which may lead to over-engineering. Recent research conducted to test this has suggested that this figure remains suitable.	The Foresight Report conducted on Future Flood Risk suggested that in order to avoid future increased flood risk, £1bn must be invested annually.	http://www.defra.gov.uk/enviro/fcd/pubs/pagn/climatechangeupdate.pdf http://www.foresight.gov.uk/Previous_Projects/Flood_and_Coastal_Defence/
Technologies	In Wales, the Welsh Assembly Government has provided guidance to the operating authorities on allowances that should be made to take into account climate change impacts. New coastal defence structures are built with an extra allowance for sea level rise and an increase in wind speeds and wave heights. New river flood defences are built to take account of a 20 per cent increase in peak flows.	Under implementation.				http://new.wales.gov.uk/topics/environmentcountryside/epq/water_flooding/flooding/?lang=en
Sector: biodiversity, environment						
Approaches / strategies	England Biodiversity Strategy's Climate Change Adaptation workstream	Under implementation. The new Climate Change workstream of the England Biodiversity Strategy	A robust, accessible, knowledge and evidence base is needed to support adaptation to climate	The obstacles to delivery include: the gaps and high degree of uncertainty in the evidence base; the time		Pages 78-79 of England Biodiversity Strategy: www.defra.gov.uk/wildlife-

		<p>was established in March 2005 to:</p> <ul style="list-style-type: none"> • develop higher level guidance about the impact of climate change on biodiversity; • develop guidance literature for biodiversity practitioners; and • identify research need and examine adaptation and resource protection strategies. 	<p>change impacts, including an established network for detecting changes in biodiversity. Initial adaptations must be integrated into all workstreams and processes established to learn from experiences and adjust strategies accordingly. Practical techniques and a strategic overview for adaptive management are needed. Also need to achieve a high level of awareness of impacts of climate change and means of adaptation in all relevant sectors, at national, regional and local levels.</p>	<p>and skills required to obtain, assimilate and communicate new knowledge; and the lack of an existing policy framework for cross-sectoral adaptation.</p>		<p>countryside/biodiversity/biostrat/indicators/pdf/grain/grainvol1v3.pdf</p>
	<p>Adaptation strategy – The Royal Botanic Gardens at Kew. Emergency plans such as using river water or Kew lake water for irrigation are being considered at Kew Gardens.</p>	<p>Under implementation (from April 2006).</p>		<p>Climate change may have positive and negative effects on species present: a warmer climate could increase this number, as well as low summer rainfall patterns could reduce them. In order to overcome this, emergency plans such as using river water or Kew lake water for irrigation are being considered, although</p>		<p>http://www.ukcip.org.uk/resources/publications/downloads.asp?ID=24</p>

				these measures could have health and environmental implications. Another option under consideration is the utilisation of the satellite garden at Wakehurst Palace, West Sussex, which is currently wetter and cooler than the ones at Kew.		
	Wildlife Trust Interim Core Policy Document on Climate Change	Underway (at April 2006)		The Wildlife Trust has produced an interim policy on climate change. The Wildlife Trust recognise a three track approach to climate change, namely; adaptation, mitigation and communication. Under the scope of adaptation the Trust aims to increase the ability of natural systems, habitats and species to react and adapt to climate change. This will largely be undertaken at the local level. Through communication the Trust aim to encourage others to take action. The Wildlife Trust will aim to raise awareness and where appropriate,		

				work in partnership.		
	Green Space Action Plan (unpublished) - includes action to improve green spaces and develop work on their role in tackling climate change	Under development	Development of the understanding and role of communities in taking action to tackle climate change and helping their local environment to adapt. Better evidence on role of green space in helping the built and natural environment adapt to climate change.	Lack of robust evidence base to support role of green spaces in tackling climate change	Some emerging good practice from New Deal for Communities areas on how communities and local partnerships are responding to climate change	
Practices	Natural England: Assessment of impacts and development of response strategies in four pilot landscape character areas in England.	Under development	Sensitivity analysis and bioclimatic assessment of valued environmental assets (up to 2050s); engagement of local stakeholders in developing response strategies; funding to deliver costed action plans.	Robustness of projections; sectoral conflicts; insufficient funding to deliver actions	None yet.	None yet.
	BRANCH project - Biodiversity Requires Adaptation in North west Europe under a Changing climate, is developing a sound evidence base to enable spatial planners to take action to promote habitat and species' resilience to climate change. Events for stakeholders in all three countries, involved in	Under implementation - completion: September 2007	Embedding of conclusions and recommendations of BRANCH project into planning policy at European, national, regional and local levels. Implementation of policies and mechanisms already available to planners to increase biodiversity's robustness to climate change.	Lack of understanding and mechanisms within planning community to implement policies which will conserve biodiversity in the future. Timescales in planning decisions are not in tune with climate change timescales.	Planners require clear, implementable, prioritised recommendations. The importance of biodiversity can be promoted through its wider benefits to society.	www.branchproject.org.uk

	the planning and biodiversity sectors have been held.					
	As part of BRANCH project, providing climate change adaptation and biodiversity 'training' for planners at regional and national level, in England, France and the Netherlands.					www.branchproject.org.uk
	MONARCH programme has examined the impacts of climate change on a range of species and habitats and considered how the modelling work could be applied to make nature conservation work more effective within the context of a changing climate.	Under implementation.				http://www.eci.ox.ac.uk/research/biodiversity/monarch.php
	PRINCE project (Climate Sensitivity of Freshwater Ecosystems)	Under implementation.	Research project developing understanding of the impacts of climate change on freshwater ecosystems in England & Wales. Research funded by a number of partner organisations, which has been key to enabling it to take place.			
	The Forestry Commission (in	Under consideration/development; identified	Completion of decision support system (ESC-	Difficulty in providing robust guidance set		http://www.forestry.gov.uk/forestry/infd-

	England) is outlining a system for climate-change proofing species choice on the public forest estate and for future inclusion within any English Woodland Grant Scheme revision.	as action in 2007-8 Corporate Plan	CC; climate change variant of Ecological Site Classification) and associated guidance	against the long time frame required for forestry and continuing uncertainty in future climate		6umkar; http://www.forestry.gov.uk/PDF/fcin069.pdf/\$FILE/fcin069.pdf
	The Forestry Commission (in England) is outlining how planting might contribute to landscape level climate change adaptation, including in the urban environment, through future changes to the English Woodland Grant Scheme.	Under consideration; identified as action in 2007-8 Corporate Plan	A system to quantify the relative value of different adaptive actions	The complex nature of assessing the full range of environmental benefits and disbenefits		
Technologies	As part of BRANCH project, modelling of: future climate space shifts for 400 species at European scale; habitat networks for 9 species at NW Europe scale; species movement in landscape (case studies in Hampshire, Kent and Limburg); Coastal vulnerability at NW Europe scale; sea-level rise and habitat vulnerability at French (Normandy) and UK (Hampshire), including visualisations of sites	Under implementation - completion: September 2007.				www.branchproject.org.uk

	under changing climate					
Sector: transport, built-environment						
Approaches / strategies	<p>Making Space for Water (MSW). DEFRA-led cross-government strategy on flood and coastal erosion risk management. Key driver for developing a new strategy was climate change and associated risks. Key relevant project is adaptation toolkit which looks at a number of approaches to help those affected, primarily by coastal change, adapt. Includes information, stakeholder engagement, land use planning and local authority powers and possible financial tools. MSW promotes a wide range of responses to adapting to climate change including: working with natural processes where possible; managed realignment; updated climate change allowances for operating authorities; promoting property</p>	<p>Under development - a programme to deliver the strategy, including the adaptation toolkit, is currently taking place.</p>	<p>Good stakeholder engagement and cross government working.</p>		<p>Wide reaching strategy needs to be backed by a good evidence base and ongoing R&D.</p>	<p>Making space for water web pages http://www.defra.gov.uk/environ/fcd/policy/strategy.htm Foresight: Future Flooding http://www.foresight.gov.uk/Previous_Projects/Flood_and_Coastal_Defence/Reports_and_Publications/index.html Planning Policy Statement 25 - flood risk http://www.communities.gov.uk/index.asp?id=1504639 Climate change allowances for operating authorities http://www.defra.gov.uk/environ/fcd/pubs/pagn/climatechangeupdate.pdf</p>

	level resilience measures; enhanced emergency preparedness measures; and strengthened planning policy guidance, which takes climate change impacts into consideration, to avoid inappropriate development in the floodplain.					
	The Welsh Assembly Government is developing the Transport Strategy for Wales which will take into consideration the impacts of climate change.	Under development.				http://new.wales.gov.uk/topics/transport/?lang=en
	Department for Transport report: Climate Change Adaptation - DfT Priorities Scoping Report	Under development.	Sufficient departmental resources; support from senior managers / Ministers	How to build climate change adaptation into strategic / business planning		
	The Changing Climate: Impact on the Department for Transport (Report by DfT)	Under consideration.				http://www.dft.gov.uk/dft_science/documents/page/dft_science_027568.hcsp
	Railway Safety - implications of weather, climate and climate change (Report by Rail Safety and Standards Board)	Under consideration.				http://www.rssb.co.uk/pdf/reports/research/Safety%20implications%20of%20weather,%20climate%20and%20climate%20change.pdf
	Planning Policy	Under development -	Detailed practice	Capacity of the	Importance of	http://www.communiti

	Statement: Planning and Climate Change (supplement to PPS1)	consultation on draft closed March 2007.	guidance needs to be developed.	planning system at regional and local levels to deliver - hence the importance of practice guidance.	addressing climate change mitigation and adaptation together rather than separately.	es.gov.uk/index.asp?id=1505140
	The Planning Response to Climate Change: Advice on Better Practice	Under implementation.	Produced in the absence of climate change PPS and associated practice guide (see above). May, as a consequence, be superseded by these documents.	N/A	N/A	http://www.planningportal.gov.uk/england/professionals/en/1112201229106.html
	Planning Policy Statement 25: Development and Flood Risk	Under implementation.	Practice guidance to be finalised.	Timing: how existing Local Development Documents will take account of PPS25; also conflicting timescales of PPS25 and Local Development Documents.	Keeping pace with rapidly changing climate change agenda - how often to revise the PPS?	http://www.communities.gov.uk/index.asp?id=1504639
	Review of Existing Buildings	Under development.	Probabilistic scenarios for future climate.	Potential for climate change mitigation measures in buildings to be ill suited to future climate conditions.	N/A	None yet - but prior work under the Review can be found at http://www.communities.gov.uk/index.asp?id=1504372
	Scottish Planning Policy (SPP) 1: The Planning System	Completed and being implemented	Scottish Planning Policy (SPP) 1 (The Planning System) states that planning should take into account the possible impacts of climate change, for example, greater rainfall and increased risk of flooding, in decisions			http://www.scotland.gov.uk/library5/planning/nppg1.pdf

			regarding the location of new development and other changes in land use.			
	<p>Sustaining Knowledge for a Changing Climate (SKCC) initiative is a collaboration between UKCIP and the Engineering and Physical Sciences Research Council (EPSRC) and builds on the earlier Building Knowledge for a Changing Climate (BKCC), which involved a £3.2 million portfolio of research into the impacts of climate change on the built environment, transport and utilities. SKCC aims are: to sustain the researcher and end user community assembled around the BKCC programme; to synthesise and disseminate results from BKCC in order to maximise impact; and to develop a coherent user-led plan for future research into the impacts of climate change on the built environment and</p>	Under implementation.				http://www.k4cc.org/

	infrastructure and development of adaptation solutions.					
Practices	Environment Agency flood guidance. Around 5 million people, in 2 million properties, live in flood risk areas in England and Wales. The Environment Agency has an important role in warning people about the risk of flooding in England and Wales, and in reducing the likelihood of flooding from rivers and the sea.	Under implementation.				http://www.environment-agency.gov.uk/subjects/flood/1217883/?version=1&lang=_e
	The 4-year ESPACE (European Spatial Planning: Adapting to Climate Events) project aims to promote awareness of the importance of adapting to climate change and to recommend that it is incorporated within spatial planning mechanisms at local, regional, national and European levels. Funded by INTERREG NW Europe and UK Department for Communities and Local Government.	Under implementation.	Input from 4 European partners to ensure best practice is shared. These then need to be communicated effectively to planners and policy makers throughout the EU	Such a multi national approach could lead to generic guidance which is difficult to apply to each member state involved. This is recognised by the project and through country level projects it hopes to overcome this issue.	Very useful to draw on the expertise of other countries, as it challenges fundamental planning approaches due to the diversity of historical influences on each countries planning systems.	http://www.espace-project.org/ The ESPACE project will be launching the Common Transnational Strategy and Policy Guidance at a conference being held in London on 29th June 2007.
	Highways Agency scoping study of work	Under development - scoping study				

	needed to revise technical standards, specifications and operational procedures because of climate change in 21st century	completed and early stage work on extreme temperatures and precipitation commenced				
	Assessment of impact of storm surge changes on Coastal railway (Dawlish), to enable strategic decision to reinforce protection or move railway.	Report completed.				
	Review of medium to long term coastal risks associated with British Energy sites: Climate Change Effects	Under development / consideration.	No need to implement the adaptation action unless new nuclear power stations are built.			Report available at http://www.metoffice.gov.uk/research/hadleycentre/pubs/brochures/
	Urban Design Compendium 2	Under development.	Effective dissemination.	N/A	The original Urban Design Compendium, which this will update, does not have sufficient emphasis on environmental sustainability of places.	The original Urban Design Compendium can be found at http://www.englishpartnerships.co.uk/publications.htm#bestpractice
	In Wales: TAN12 on Design sets out what local authorities and developers should be considering in planning for resource efficient development. Recommends measures to achieve resource efficiency through the design process; such as ensuring the siting, layout and design of buildings maximise	Under implementation				http://new.wales.gov.uk/about/departments/dpec/epcpublications/PlanPubs/TAN/TAN12?lang=en

	natural heating, cooling and ventilation.					
	Transport Wales is undertaking a programme of inspections and investigations to ensure that slopes above trunk roads are stable and not likely to be mobilised by extreme wet weather.	Under implementation.				http://new.wales.gov.uk/topics/transport/?lang=en
	In Wales: TAN 15 on Planning reflects the increased risk of flooding posed by climate change and the need to think seriously about the consequences of that increased risk in making decisions on developments. Local Planning Authorities are currently preparing Local Development Plans and where relevant, will be undertaking broad level or strategic flood consequences assessments to underpin plan preparation and shape growth in their areas.	under implementation				
	Transport Wales are looking at the areas of the network that are currently susceptible to regular flooding and	Under implementation.				http://new.wales.gov.uk/topics/transport/?lang=en

	considering how the worst of these can be addressed.					
Technologies	Sustainable Urban Drainage Systems	Under implementation.	Uptake by the construction industry / developers	Long term maintenance of such systems can sometimes be a problem	A system which we have been advocating for many years as it improves resilience to drought and reduces flood risk.	http://www.environment-agency.gov.uk/business/444304/502508/?version=1&lang=_e
	Environment Agency: Flood Ranger - computer simulation tool	Under implementation.	Access to CD - training tool to help planners understand the implications of their planning actions. Virtual world created which then allows you to simulate certain climate change scenarios	Theoretical tool that is not specific to any particular area. New version available which simulates flood impacts on the Thames Estuary	Valuable training tool to get key messages to planning staff	http://www.espace-project.org/
Sector: historic environment						
Practices	Rapid coastal zone assessment of historic sites threatened by coastal change and development of guidance	Under implementation.	Completion of national coastal survey and integration within Defra and Environment Agency coastal defence strategies	Limited resources to deliver		www.helm.org.uk/climate change
	Advice on predicting and managing the effects of Climate Change on World Heritage.	Under implementation.	Ownership of guidance to be taken by World Heritage Committee and states party to the World Heritage Convention	Reliability of current climate change scenarios		Report to the 30th session of the World Heritage Committee (Vilnius, 2006) www.helm.org.uk/climate change
	Web-based advice on improving energy efficiency in historic buildings	Under development	Completion and dissemination of guidance			www.helm.org.uk/climate change
	Advice on fitting micro-renewable	Under development	Completion and dissemination of			Web address to be confirmed

	generation		guidance			
Sector: energy						
Practices	Act now: adapting energy infrastructure Northern Ireland Electricity	Ongoing/continuous programme (at April 2006)	'Northern Ireland Electricity are currently strengthening their infrastructure, in response to the 1998 floods and storms.			
	GENESIS - A Generic Process for Assessing Climate Change Impacts on the Electricity Supply Industry and Utilities	Completed (at April 2006)	This project will develop a generally applicable methodology for assessing the impact of climate change on the performance of the electricity supply industry. The generic assessment process will provide the currently missing integrated framework that is essential if the many technical and business risks that climate change may impose on the electricity supply industry are to be properly mediated and managed. The study concentrated on two exemplar aspects, namely: the impact on electricity consumption patterns and the impact on wind power generation			http://esi.eerc.bris.ac.uk/
	Maintaining a reliable and resilient energy	Under implementation.	Requirement for a dependable system of	The UK will become increasingly reliant on	Following the storms in the UK of October	Energy Review Report, July 2006

	system in the long term		physical distribution networks and access to sufficient and affordable energy.	imports of oil, coal and particularly gas as domestic production of these fuels declines. The UK will also need substantial new investment in electricity generation capacity to replace coal oil and nuclear power stations and to meet expected growth in electricity demand.	2002, the government has been working with the electricity industry to strengthen the resilience of the UK's electricity networks and to better prepare for the future. As a result the industry response to recovery from more recent storm-related events has in general been more successful in restoring supplies as quickly as possible.	(http://www.dti.gov.uk/energy/review/page31995.html)
	Climate change will change the type and severity of impacts which we should plan to respond to. The normal approach for contingency planning in the UK is to adopt an all-hazards approach and prepare a response which is flexible and can be ramped up, if necessary. However, not all planners would be able to claim that they had an understanding of how climate change may pose problems. All levels of Government (and all Departments)					

	<p>need to factor-in the possible changes which climate change could bring about in respect of contingency planning but that is easy to say and much more of a challenge in practice. The Adaptation Policy Framework will help to address this issue.</p>					