AELCLIC

AELCLIC Pathfinder project

DELIVERABLE 2

Climate Change Impacts, Opportunities, Solutions and Obstacles in all Pilot Landscapes

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AUTHORS:

Bas Pedroli (University of Wageningen)
Juanjo Galan (Aalto University)
Daniele Torregiani (University of Bologna)
Ludovica Marinaro (University of Bologna)
Francisco Galiana (Polytechnic University of Valencia)
Emilio Servera (Polytechnic University of Valencia)

INTRODUCTION

Background

This DELIVERABLE 2 compiles the results from those workshops held by the AELCLIC local networks (see Deliverable 1) that co-defined strategic topics to address Climate Change Adaptation and co-identified Climate Change Impacts, Opportunities, Solutions and Obstacles for the defined topics in the AELCLIC leading and multiplier pilot landscapes.

Objectives

The AELCLIC-PATHFINDER defines, tests and disseminates proactive and catalysing models for the configuration of regional/local consortia with the social, financial, administrative and technical capacity to co-define in the future Landscape Adaption Plans to Climate Change (LACAPs hereafter). A LACAP would include regional/local policies, strategies, pilot actions and initiatives to promote Climate Change adaptation and mitigation (see produced inputs for potential LACAPS in Deliverable 3).

This DELIVERABLE 2 aims to give an overview of the co-identified Climate Change Impacts, Opportunities, Solutions and Obstacles at have been put forward in the various pilot landscapes during the preparation of the key contents or inputs for potential future LACAPs.

RESULTS

Climate Change Impacts, Opportunities, Solutions and Obstacles

Key Impacts

Given that the main issues of climate change are increasing the incidence of wet and dry spells, and of periods with more precipitation or less, with warmer or colder weather, and with more extreme weather conditions, the impacts of climate change are felt strongly all over Europe. The climate impacts as perceived vary over the pilot landscapes, but some key impacts are mentioned in almost all pilot landscapes.

The Table 1a gives a summary of these **key impacts** and links them with the Climate Change impacts identified by the European Environmental Agency (EEA) (connect the acronyms of the Table 1a with the ones of the Table 1b) and with the Climate Change Risks listed in the 5th assessment report of the Intergovernmental Panel on Climate Change Climate (IPCC) 2014 (connect the acronyms of the Table 1a with the ones of the Table 1c).

The connection between the Climate Change Impacts co-identified by the AELCLIC local networks in the 15 AELCLIC Pilot landscapes and the impacts listed by the EEA for different European regions and for different topics is quite evident since the discussions on the AELCLIC workshops were activated by sharing with the participants a synthesis of the materials produced by the EU, EEA, national goveranments and regional/local administrations.

Table 1a | Types of Climate Change Impacts as perceived by the Local Networks in the geographical areas of the AELCLIC-Pathfinder project and connection to Climate Change Impacts detected by the European Environmental Agency (see Table1b, 2012) and the Climate Change Risks identified by the IPCC (see Table 1c, 2014)

	Key impact	*North*	*Atlantic*	*Alpine*	*South west*	*South east*
CLIMATE	**Temperature**	**XX** CLI1 ARC-1, NOR-1	**X** CLI1	**XX** CLI1 ALP-1	**XXX** CLI1 MED-1	**XXX** CLI1 CEE-1, CEE-3, MED-1
	Precipitation & Storms	**X** CLI2, CLI3	**XX** CLI2, CLI3	**X** CLI2, CLI3	**XXX** CLI2, CLI3 MED-2	**XXX** CLI2, CLI3 CEE-2, MED-2
SOIL	**Soil Degradation**	**X** SOI1, SOI3	**XX** SOI1, SOI3	**XX** SOI1, SOI2, SOI3	**XXX** SOI1, SOI2, SOI3	**XXX** SOI1, SOI2, SOI3
CRYOSPHERE	**Snow cover and glaciers**	**XX** CRY1, CY2 ARC-2, NOR-2	-	**XXX** CRY1, CRY2, CRY5 ALP-2	-	XX
	Permafrost	**XX** CRY5 / ARC-4	-	**XX** CRY5 / ALP3	-	-
ECOSYSTEMS	**Terrestrial Ecosystems & Biodiversity**	**XX** ECO1, ECO2, ECO3, ECO4 ARC-5, NOR-4 IPCC-A3, IPCC-H2	**X** ECO1, ECO2, ECO3, ECO4 NEW-3 IPCC-A1, IPCC-A2, IPCC-A3, IPCC-H2	**XX** ECO1, ECO2, ECO3, ECO4 ALP-4, ALP-5 IPCC-A1, IPCC-A2, IPCC-A3, IPCC-H2	**XX** ECO1, ECO2, ECO3, ECO4 MED-4 IPCC-A1, IPCC-A2, IPCC-A3, IPCC-H2	**X** ECO1, ECO2, ECO3, ECO4 MED-4 IPCC-A1, IPCC-A2, IPCC-A3, IPCC-H2
	Oceans and marine environments	**XX** OCE3, OCE4, OCE5 IPCC-B1, IPCC-B3	**XX** OCE3, OCE4, OCE5 IPCC-B1, IPCC-B3		**X** OCE3, OCE4, OCE5 IPCC-B1, IPCC-B3	**X** OCE3, OCE4, OCE5 IPCC-B1, IPCC-B3
	Invasive Species, diseases and pests	**X** NOR-4 IPCC-A1, IPCC-A2,	**X** IPCC-A1, IPCC-A2,	**XX** IPCC-A1, IPCC-A2,	**XX** IPCC-A1, IPCC-A2,	**XX** IPCC-A1, IPCC-A2,
SEA AND FRESH WATER SYSTEMS	**Flood risk (river or sea)**	**XXX** NOR-3 IPCC_G2	**XXX** NEW-2, SEA-1 IPCC_G2	**XX** IPCC_G2	**XX** MED-3 IPCC_G2	**XX** MED-3 IPCC_G2, IPCC_G9
	Coastal zones	**X** COA1 SEA-1, SEA-2, SEA-4	**XXX** COA1, COA2, COA3 NEW-5, SEA-1, SEA-4, SEA-6		**XX** COA1, COA3 SEA-1, SEA-2, SEA-4, SEA-6	**X** COA1, COA3 SEA-1, SEA-2
	Water Infrastructure and Sewage system	**XX** WAT1, WAT2, WAT4	**XX** WAT1, WAT2, WAT4	**X** WAT1, WAT2, WAT4	**XX** WAT1, WAT2, WAT3, WAT4	**XXX** WAT1, WAT2, WAT3, WAT4
	Surface water quality and pollution	**X** WAT5, WAT6	**X** WAT6	**X** WAT6	**XX** WAT6	**XX** WAT6
PUBLIC HEALTH & SOCIAL ISSUES	**Public health**	**XX** HUM1, HUM4 IPCC-G4, IPCC-F1, IPCC-F3	**X** HUM1 IPCC-G4, IPCC-F1	**X** HUM1 IPCC-G4, IPCC-F1	**XX** HUM1, HUM4 MED-10 IPCC-G4, IPCC-F1, IPCC-F3	**XX** HUM1, HUM4 MED-10 IPCC-G4, IPCC-F1, IPCC-F3
	Water supply	-	**X** IPCC-D3		**XXX** IPCC-D3, IPCC-H1	**XX** IPCC-D3, IPCC-H1
	Extreme temperatures and Heat waves	**X** HUM2	**XX** HUM2	**X** HUM2	**XXX** HUM2 MED-9 IPCC_D2	**XX** HUM2 MED-9 IPCC_D2
	Life in cities	**X** IPCC-D2, IPCC-D5, IPCC-D6, IPCC.D7, IPCC-D8,	**XX** IPCC-D2, IPCC-D5, IPCC-D6, IPCC.D7, IPCC-D8, IPCC-D9	-	**XXX** HUM3 IPCC-D1, IPCC-D2, IPCC-D3, IPCC-D4, IPCC-D5, IPCC-D6, IPCC.D7, IPCC-D8, IPCC-D9, IPCC-D10	**XXX** HUM3 IPCC-D1, IPCC-D2, IPCC-D3, IPCC-D4, IPCC-D5, IPCC-D6, IPCC.D7, IPCC-D8, IPCC-D9, IPCC-D10
	Livelihood, cultural identity and poverty	**XX** IPCC_G4, IPCC_G5	**X** IPCC_G5	**XX** IPCC_G4, IPCC_G5	**XX** IPCC_G3, IPCC_G4, IPCC_G5, IPCC_G6; IPCC_G9	**XX** IPCC_G3, IPCC_G4, IPCC_G5, IPCC_G6, IPCC_G9
LAND-USE	**Land abandonment**	**X** IPCC-G4	**XX** IPCC-G4	**XXX** IPCC-G4	**XX** MED-8 IPCC D9I, PCC-G4	**XX** MED-8 IPCC D9I, PCC-G4
	Desertification	-	-	-	**XXX** MED-5, , MED-8 IPCC_A1, IPCC D9	**XX** MED-5, MED-8 IPCC_A1, IPCC D9
ECONOMY	**Agriculture & Forestry**	**XXX** AGRO1, AGRO2, FOR1 NOR-5 IPCC-C1, IPCC-E3, IPCC-J2, IPCC_G4, IPCC_G7	**XXX** AGRO1, AGRO2, AGRO3, FOR1 IPCC-C1, IPCC-E3, IPCC-J2, IPCC_G4, IPCC_G7	**XXX** AGRO1, AGRO2, AGRO3, FOR1 IPCC-C1, IPCC-E3, IPCC-J2, IPCC_G4, IPCC_G7	**XXX** AGRO1, AGRO2, AGRO3, AGRO4, FOR1 MED-6, MED-7, MED-8 IPCC-C1, IPCC-E3, IPCC-J2, IPCC_G1, IPCC_G4, IPCC_G7	**XXX** AGRO1, AGRO2, AGRO3, AGRO4, FOR1 MED-6, MED-7, MED-8 IPCC-C1, IPCC-E3, IPCC-J2, IPCC_G1, IPCC_G4, IPCC_G7
	Forest fires	**X** FOR2	**X** FOR2	**XX** FOR2	**XXX** FOR2 MED-8	**XXX** FOR2 CEE-1, MED-8
	Local products	**XX** IPCC-E3	**X** IPCC-E3	**XXX** IPCC-E3	**X** IPCC_C2, IPCC-E3	**X** IPCC_C2, IPCC-E3
	Tourism	**X** TOU1 NOR-9	**X** TOU1	**XXX** TOU1 ALP-7	**XX** TOU1 MED-12	**X** TOU1 MED-12 IPCC-F3
	Failures in interconnected sectors	**X** IPCC-J1				
INFRASTRUCTURES	**Infrastructures / Mobility / Public transport**	**XX** TRA1	**X** TRA1	**XX** TRA1	**X** TRA1 IPCC-D6	**X** TRA1 IPCC-D6
ENERGY	**Energy consumption and production**	**X** ENE1 ARC-6, NOR6, NOR-7 IPCC-J3	**X** ENE1	**X** ENE1	**XX** ENE1	**XX** ENE1

X moderate, XX strong, XXX very strong impacts perceived by AELCLIC local networks (see Tables 1b and 1c for the acronyms)

Table 1b | Main climate change, impacts and vulnerability in europe 2012 (EEA (European Environmental Agency) report no 12/2012) .(*) indicates the impacts raised and discussed in the AELCLIC workshops

CLIMATE CHANGE, IMPACTS AND VULNERABILITY IN EUROPE 2012 (EEA REPORT NO 12/2012)			
Changes in the climate system, environmental systems, socio-economic systems and human health	**code**	**Key observed and projected climate change and impacts for the main regions in Europe**	**code**
Key Climatic Variables		**Artic**	
(*) Temperature	CLI1	(*) Temperature rise much larger than global average	ARC-1
(*) Precipitation	CLI2	(*) Decrease in Arctic sea ice coverage	ARC-2
(*) Storms	CLI3	Decrease in Greenland ice sheet	ARC-3
Cryosphere		(*) Decrease in permafrost areas	ARC-4
(*) Snow cover	CRY1	(*) Increasing risk of biodiversity loss	ARC-5
Greenland ice sheet	CRY2	(*) Intensified shipping and exploitation of oil and gas resources	ARC-6
(*) Glaciers	CRY3	**Northern Europe**	
(*) Arctic and Baltic Sea ice (N)	CRY4	(*) Temperature rise much larger than global average	NOR-1
(*) Permafrost	CRY5	(*) Decrease in snow, lake and river ice cover	NOR-2
Oceans and marine environment		(*) Increase in river flows	NOR-3
Ocean acidification	OCE1	(*) Northward movement of species	NOR-4
Ocean heat content (N)	OCE2	(*) Increase in crop yields	NOR-5
(*) Sea surface temperature	OCE3	(*) Decrease in energy demand for heating	NOR-6
(*) Phenology of marine species	OCE4	(*) Increase in hydropower potential	NOR-7
(*) Distribution of marine species	OCE5	Increasing damage risk from winter storms	NOR-8
Coastal zones		(*) Increase in summer tourism	NOR-9
(*) Global and European sea-level rise	COA1	**North-western Europe**	
(*) Storm surges	COA2	Increase in winter precipitation	NEW-1
(*) Coastal erosion	COA3	(*) Increase in river flow	NEW-2
Freshwater quantity and quality		(*)Northward movement of species	NEW-3
(*) River flow	WAT1	Decrease in energy demand for heating	NEW-4
(*) River floods	WAT2	(*) Increasing risk of river and coastal flooding	NEW-5
(*) River flow drought	WAT3	**Mountain areas**	
(*) Water temperature	WAT4	(*) Temperature rise larger than European average	ALP-1
(*) Lake and river ice cover	WAT5	(*) Decrease in glacier extent and volume	ALP-2
(*) Freshwater ecosystems and water quality	WAT6	(*) Decrease in mountain permafrost areas	ALP-3
Terrestrial ecosystems and biodiversity		(*) Upward shift of plant and animal species	ALP-4
(*) Plant and fungi phenology	ECO1	(*) High risk of species extinction in Alpine regions	ALP-5
(*) Animal phenology	ECO2	Increasing risk of soil erosion	ALP-6
(*) Distribution of plant species	ECO3	(*) Decrease in ski tourism	ALP-7
(*) Distribution and abundance of animal species	ECO4	**Coastal zones and regional seas**	
Soil		(*) Sea-level rise	SEA-1
(*) Soil organic carbon	SOI1	(*) Increase in sea surface temperatures	SEA-2
(*) Soil erosion	SOI2	Increase in ocean acidity	SEA-3
(*) Soil moisture	SOI3	(*) Northward expansion of fish and plankton species	SEA-4
Agriculture		Changes in phytoplankton communities	SEA-5
(*) Growing season for agricultural crops	AGRO1	(*) Increasing risk for fish stocks	SEA-6
(*) Agrophenology	AGRO2	**Central and eastern Europe**	
(*) Water-limited crop productivity	AGRO3	(*) Increase in warm temperature extremes	CEE_1
(*) Irrigation water requirement	AGRO4	(*) Decrease in summer precipitation	CEE_2
Forests and forestry		(*) Increase in water temperature	CEE_3
(*) Forest growth	FOR1	(*) Increasing risk of forest fire	CEE_4
(*) Forest fires	FOR2	Decrease in economic value of forests	CEE_5
Fisheries and aquaculture	FOR3	**Mediterranean region**	
Human health		(*) Temperature rise larger than European average	MED-1
(*) Floods and health	HUM1	(*) Decrease in annual precipitation	MED-2
(*) Extreme temperatures and health	HUM2	(*) Decrease in annual river flow	MED-3
(*) Air pollution by ozone and health	HUM3	(*) Increasing risk of biodiversity loss	MED-4
(*) Vector-borne diseases	HUM4	(*) Increasing risk of desertification	MED-5
Water- and foodborne diseases	HUM5	(*) Increasing water demand for agriculture	MED-6
Energy		(*) Decrease in crop yields	MED-7
(*) Energy consumption (e.g. cooling)	ENE1	(*) Increasing risk of forest fire	MED-8
Transport		(*) Increase in mortality from heat waves	MED-9
(*) Disturbances in transport system and mobility	TRA1	(*) Expansion of habitats for southern disease vectors	MED-10
Tourism		Decrease in hydropower potential	MED-11
(*) Change in tourism patterns	TOU1	(*) Decrease in summer tourism and potential increase in other seasons potential increase in other seasons	MED-12

(*): Discussed and addressed in the AELCLIC workshops

Table 1c | Main RISKS associated to climate change according to the *Climate Change 2014: impacts, adaptation, and vulnerability. part a: global and sectoral aspects. contribution of working group II to the fifth assessment report of the intergovernmental panel on climate change* .(*) indicates the impacts raised and discussed in the AELCLIC workshops

HAZARDS, KEY VULNERABILITIES, KEY RISKS, AND EMERGENT RISKS	code
KEY RISKS_Terrestrial and Inland Water Systems	
(*) Loss of native biodivesity, increase non-native organism dominance	**IPCC_A1**
(*) Novel and/or much more severe pest and pathogen outbreaks	**IPCC_A2**
(*) Changes in plant functional type mix leading to biome change with respective risks for ecosystems and ecosystem services	**IPCC_A3**
KEY RISKS_Ocean Systems	
(*) Loss of endemic species, mixing of ecosystem types, increased dominance of invasive organisms	**IPCC_B1**
Loss of coral cover and associated ecosystem with reduction of biodiversity and associated ecosystem services	**IPCC_B2**
(*) Unknown productivity and services of new ecosystem types	**IPCC_B3**
Loss of larger animals and plants, shifts to hipoxia-adapted, largely microbial communities with reduced biodiversity	**IPCC_B4**
Enhanced frequency o dinoflagellate blooms and respective potential losses and degradations of coastal ecosystems and ecosystem services	**IPCC_B5**
KEY RISKS_Food Security and Food Production Systems	
(*) Crop failures, breakdown of food distribution and storage processes	**IPCC_C1**
(*) Crop failure, risk of limited food access and quality	**IPCC_C2**
KEY RISKS_Urban Areas	
(*) Deaths and injuries and disruptions to livelihoods/incomes, food supplies, and drinking water	**IPCC_D1**
(*) Mortality and morbidity increasing, including shifts in seasonal patterns and concentrations due to hot days with higher or more prolonged high temperatures or unexpected cold spells. Avoiding risks often most difficult for low-income groups	**IPCC_D2**
(*) Constraints on urban water provision services to people and industry with human and economic impacts. Risk of damage and loss to urban ecology and its services including urban and peri-urban agriculture.	**IPCC_D3**
(*) Lowered quality of life, decreased competitiveness of global cities to attract key workers and investment	**IPCC_D4**
(*) Damage to networked infrastructure. Risk of loss of human life and property	**IPCC_D5**
(*) Damage to dwellings, businesses, and public infrastructure. Risk of loss of function and services. Challenges to recovery, especially where insurance is absent	**IPCC_D6**
(*) Potential of psychological shock from unanticipated risks	**IPCC_D7**
(*) Failures within coupled systems, e.g., reliance of drainage systems on electric pumps, reliance of emergency services on roads and telecommunications.	**IPCC_D8**
(*) Damage to or degradation of soils, water catchment capacity, fuel wood production, urban and peri-urban agriculture, and other productive or protective ecosystem services. Risk of knockon impacts for urban and peri-urban livelihoods and urban health	**IPCC_D9**
(*) Risk due to increases in exposure to diseases (food-borne, water-borne, malaria dengue and other vector-borne diseases influenced by climate change)	**IPCC_D10**
KEY RISKS_Rural Areas	
Famine. Risk of loss of revenues from livestock trade	**IPCC_E1**
(*) Economic losses for artisanal fisherfolk, due to declining catches and incomes and damage to fishing gear and infrastructure	**IPCC_E2**
(*) Reduced agricultural productivity of rural people, including those dependent on rainfed or irrigated agriculture,or high-yield varieties, forestry, and inland fisheries.	**IPCC_E3**
KEY RISKS_Human Health	
(*) Risk of increased mortality and morbidity during hot days and heat waves, particularly among manual workers in hot climates	**IPCC_F1**
Risk of a larger burden of disease and increased food insecurity for particular population groups.	**IPCC_F2**
(*) Increasing health risks due to changing spatial and temporal distribution of diseases strains public health systems, especially if this occurs in combination with economic downturn	**IPCC_F3**
Progress to date in reducing childhood deaths from diarrheal disease is compromised	**IPCC_F4**
KEY RISKS_Livelihoods and Poverty	
(*) Irreversible harm due to short time for recovery between droughts, approaching tipping point in rainfed farming system and /or pastoralism	**IPCC_G1**
High morbidity and mortality due to floods and flash floods. Factors that further increase risk may include a shift from transient to chronic poverty due to eroded human and economic assets (e.g., labor market) and economic losses due to infrastructure damage.	**IPCC_G2**
(*) Shift populations from transient to chronic poverty due to persistent and irreversible socioeconomic and political marginalization. The lack of governmental support, as well as limited effectiveness of response options, increase the risk	**IPCC_G3**
(*) Loss of rural livelihoods, severe economic losses in agriculture, and damage to cultural values and identity; mental health impacts (including increased rates of suicide).	**IPCC_G4**
(*) Risk of severe harm and loss of livelihoods. Potential loss of common-pool resources; of sense of place, belonging, and identity	**IPCC_G5**
(*) Increased morbidity and mortality due to heat stress, among male and female workers, children, and the elderly, limited protection due to socioeconomic discrimination and inadequate governmental responses	**IPCC_G6**
(*) Risks of crop failure and food shortage	**IPCC_G7**
Harm and loss of livelihoods for some rural residents due to soaring demand for biofuel feedstocks and insecure land tenure and land grabbing	**IPCC_G8**
(*) Loss of livelihoods and harm due to shorter time for recovery between extremes. Pastoralists restocking after a drought may take several years; in terraced agriculture, need to rebuild terraces after flood, which may take several years	**IPCC_G9**
Emergent Risks and Key Vulnerabilities	
(*) Harm and loss due to livelihood degradation from systematic constraints on water resource use that lead to supply falling far below demand. In addition, limited coping and adaptation options increase the risk of harm and loss.	**IPCC_H1**
(*) Risk of large-scale species richness loss over most of the global land surface. 57 ± 6% of widespread and common plants and 34 ± 7% of widespread and common animals are expected to lose ≥50% of their current climatic range by the 2080s leading to loss of services	**IPCC_H2**
Europe (specific Key Risks)	
(*) Risk of new systemic threats due to stress on multiple and interconnected sectors. Risk of failure of service provision of one or more sectors	**IPCC_J1**
(*) Risk of increases in crop losses and animal diseases or even fatalities of livestock	**IPCC_J2**
(*) Increasing risk of power shortages due to limited energy supply, e.g., of nuclear power plants due to limited cooling water during heat stress	**IPCC_J3**
(*): Discussed and addressed in the AELCLIC workshops	

Opportunities

Many opportunities and solutions to counteract the perceived impacts have been put forward in the workshops. Some opportunities apply to all pilot landscapes, such as new land use types and multifunctionality. Still, depending on the impacts identified, most opportunities and solutions vary across Europe. In the Northern and Atlantic regions, much importance is attributed to Local circularity to prevent large distances of energy transport. Also community supported agriculture seems to have large opportunities particularly in these areas. Combatting heat waves, extreme events such as floodingsand forest fires is particularly acute in the Mediterranean regions, although also elsewhere, all over Europe, forest fires are more frequent.

The below table gives a summary of the opportunities for climate adaptation and mitigation identified.

Table 2 | Main types of opportunities arising from climate adaptation and mitigation as identified by the Local Networks in the geographical areas of the AELCLIC-Pathfinder project.

Opportunity	*North*	*Atlantic*	*Alpine*	*South west*	*South east*
Local circular energy provision	XXX	X	XXX	X	XX
Increase energy efficiency	XXX	XX	XXX	XX	XXX
Community supported agriculture	XXX	XX	XXX	XX	XX
New land use types and crop varieties	XXX	XXX	XXX	XXX	XXX
Increase resilience by multifunctionality	XXX	XXX	XXX	XXX	XXX
Diversification of local products	XX	XX	XXX	XX	XX
Forest management to decrease fires	X	X	XX	XXX	XX
Introduce (or adapt) irrigation systems	-	XX	XX	XXX	XXX
Better water management and use	XX	XXX	XX	XX	XXX
Public awareness raising	XX	XX	XX	XX	XXX
Green for thermal regulation	X	X	X	XXX	XXX
Increase efficiency of spatial planning	X	X	XX	XXX	XXX
Increase water retention	XX	XXX	XXX	XXX	XXX
Promote more effective governance	XX	XX	XX	XXX	XXX
X moderate, XX medium, XXX high potential perceived					

Obstacles and Barriers

Where opportunities are being identified they cannot always be implemented, because of cultural, economic, juridical or political barriers. At the same time, funding the solutions can also be a tough challenge. In general, the market mechanism is felt strongly all over Europe, while governance is less adequate in the Alpine and especially South-eastern regions. The lack of funding is being felt very strongly all over Europe. This applies both to public funding and to commercial investment.

Table 3 | Main types of obstacles and barriers for climate adaptation and mitigation as identified by the Local Networks in the geographical areas of the AELCLIC-Pathfinder project.

Obstacles and Barriers	*North*	*Atlantic*	*Alpine*	*South west*	*South east*
Inadequate governance	X	X	XX	XXX	XXX
Decreasing level of local knowledge	X	XX	XXX	XX	XX
Decreasing awareness of landscape values	X	XX	XXX	XXX	XXX
Market mechanism, profit orientation	XX	XX	XX	XX	XX
Inadequate management of private property	XX	XX	XXX	XXX	XXX
Reluctance to adopt technological solutions	XX	X	XX	XX	XX
Lack of funding (public or private)	XX	XXX	XXX	XXX	XXX
X moderately strong , XX strong, XXX very strong obstacle					

CONCLUSION

Various conclusions regarding the co-identification of Climate Change Impacts, Opportunities, Solutions and Barriers can be drawn from the large variety of findings in the various pilot landscapes. At the same time, those co-identified inputs can be analysed from the perspective of the Feasibility, Legitimacy, Governance and Relation to Existing Policies of the proposed "programmatic documents or inputs" for future LACAPS. First, the main findings of the AELCLIC PATHFINDER can be mentioned as regards the impacts of climate change on the landscape and the opportunities to overcome the negative effects of climate change.

Main findings

1. **The impacts of climate change on the landscape are felt strongly by the local communities in 15 pilot landscapes all over Europe**
2. **The continuing climate change is perceived as a strong threat for environmental, economic and societal sustainability, including the future of agriculture, forestry, tourism, ecosystem functioning, wellbeing and quality of life**
3. **At the same time many opportunities are identified to adapt to and to mitigate climate change**
4. **Generally, local solutions are preferred, and many ideas were put forward to organise climate adaptation and mitigation at a local or regional scale**
5. **The support of both market mechanisms and national/international public policies is generally perceived as largely insufficient.**
6. **Incentives to foster the identification of funding opportunities for climate–friendly solutions should be promoted more strongly by the regional and national authorities.**

As explained in the Deliverables 1, 3, 4, 5 and 6 of the AELCLIC project, the legitimacy of the works developed by the 15 AELCLIC Local Networks in their respective pilot landscapes, the feasibility and implementability of the proposed outlines for Landscape Adaptation Plans to Climate Change (LACAPs) as well as the possible utility of the findings from the AELCLIC_pathfinder project in the definition of more adequate models for Climate Change governance, were all crucial aspects in the development of all the phases of the AELCLIC project. Accordingly, these concepts also determined the methods and approaches used for the local co-identification of Climate Change Impacts.

Feasibility

Even in the co-identification of Climate Change impacts, it was detected that in most pilot landscapes one could find reference to governmental climate policies, but these references were generally very poorly formulated, and often budgets were not available to foster these policies on local and regional level. In this respect, feasibility of the identified measures and action plans is limited. Two exceptions can be mentioned. On one hand, the Dutch Pilot Case can be mentioned, which shows that the National Delta Plan on Spatial Adaptation is translated by the Provinces into a series of (cyclical) processes to arrive at concrete action plans: from Climate Stress Test, through Vulnerability Assessment and Area-specific Dialogues to Environmental Visions and Implementation. On the other hand, and concerning every pilot landscape in the WP4, the Spanish National Adaptation Plan to date, has focused in providing a broad and deep knowledge base that can be used in any adaptation plan or project in the country rather than in establishing general policies. Therefore, data and findings from the Spanish National Adaption Plan should be considered the basis for the development of any of the potential LACAPs in the WP4 pilot landscapes.

Legitimacy

The information produced in the AELCLIC workshops was an activator for the development of future Plans or for the incorporation in other Spatial or Sectorial Plans (see Deliverable 3). These plans will be expected to include the official participation processes foreseen in the local or regional planning system. The qualitative contribution of the diagnosis process conducted within the AELCLIC project was particularly useful and appreciated. It demonstrated its importance and necessary complementarity to most common quantitative surveys in restoring a more faithful picture of the landscape transformations due to Climate Change. In most of the cases, in fact, the local or regional authorities actively supported the participatory activities.

Governance

Adequate governance has often been mentioned as a failing instrument in supporting participatory local dialogues on climate change impacts and opportunities to combat these. If governance would be more pro-active in this sense, many participants stated that they would be ready to take more (economic) risks to adapt to climate change, or contribute to mitigation measures. A strong participatory process as well as the "Local network" or consortium approach, as implemented in the AELCLIC project, were proposed in many landscapes as key components of an adequate governance model for Climate Change adaptation (see Deliverables 1, 3, 4 and 5).

Relation to Existing Policies

National Adaptation Strategies and Plans

National Adaptation Strategies and Plans are a key instrument in developing local adaptation strategies, including landscape quality. The November 2018 evaluation package of the EU Adaptation Strategy contains an Adaptation Preparedness Scoreboard (see https://ec.europa.eu/clima/policies/adaptation/what_en) with assessments for each of the Member States national adaptation strategies. A horizontal assessment is reported in https://ec.europa.eu/clima/sites/clima/files/adaptation/what/docs/horizontal_assessment_en.pdf: the current state of affairs concerning National Adaptation Strategies (NAS) and National Adaptation Plans (NAP) in the countries covered by AELCLIC is as follows (see Table 4).

Table 4 | Adaptation Preparedness Scoreboard as presented in the November 2018 evaluation package of the EU Adaptation Strategy (European Commision, 2018)

Year	***Adoption of 1st NAS***	***Adoption of 1st NAP***
2005	FI	
2006	ES, FR	ES (1st NAP)
2007	NL (1st NAS)	
2009		ES (2nd NAP)
2011		FR
2012	IE (1st NAS)	
2013	RO (1st NAS)	ES (3rd NAP)
2014		FI
2015	IT	
2016	NL (2nd NAS)	RO
2018	IE (2nd NAS)	IE, NL
To be adopted/ Draft available		IT

National Energy and Climate Plans

According to the governance of the energy union and climate action rules, which entered into force on 24 December 2018, EU countries are required to

- develop integrated National Energy and Climate Plans (NECPs) that cover the five dimensions of the energy union for the period 2021 to 2030 (and every subsequent ten year period) based on a common template
- submit a draft NECP by 31 December 2018 and be ready to submit the final plans by 31 December 2019 to the European Commission
- report on the progress they make in implementing their NECPs, mostly on a biennial basis

The Commission will monitor EU progress (as a whole) towards achieving these targets, notably as part of the annual state of the energy union report. The new governance rules underline the importance of effective public participation and regional cooperation in the development and implementation of these NECPs, ensuring that the views of citizens and businesses as well as regional and local authorities are heard.

Once submitted, the NECPs were assessed and analysed by the Commission. On 18 June 2019, the Commission published a Communication assessing the 28 draft NECPs as a whole, together with specific recommendations and a detailed "Staff Working Document" for each Member State.

These National Energy and Climate Plans largely refer to national measures; landscape is hardly mentioned in any of them, nor is there any emphasis on integrated assessments at landscape level. In their assessment of the NECPs the Commission, however, emphasises the importance of broad stakeholder involvement.

The outlines of LACAPs as reported by the AELCLIC Pathfinder (see Deliverable 3) might very well support National Adapation Stragies and Plans as well as National Energy and Climate Plans with concrete implementation steps, and possibly quantifiable effectiveness.

Appendix

WP2

Northern Europe

WP3

Atlantic & Alpine Europe

WP4

South Western Europe

WP5

South Eastern Europe

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