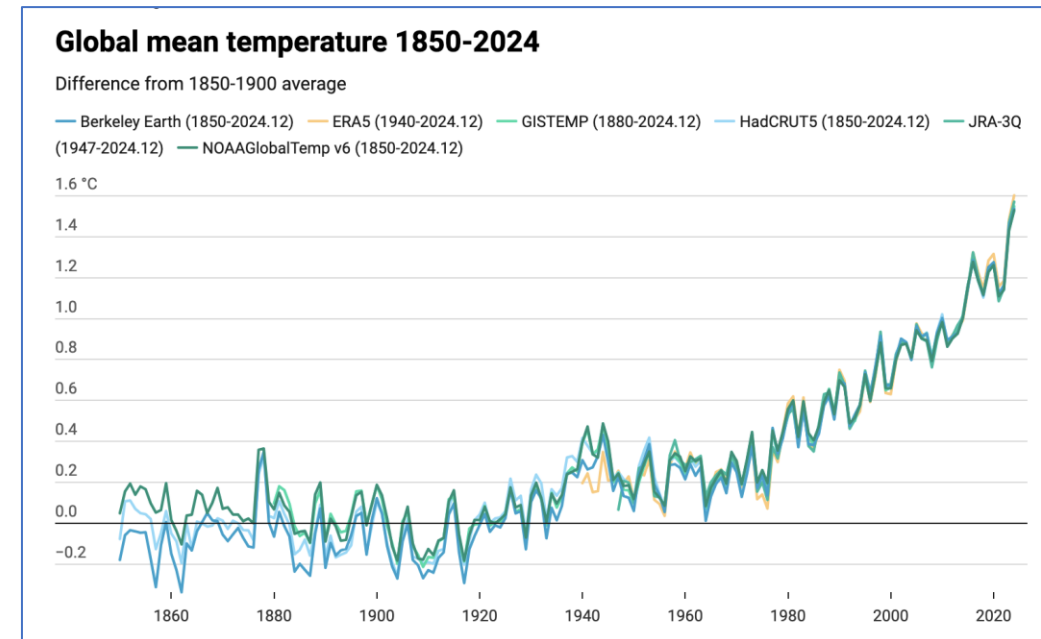
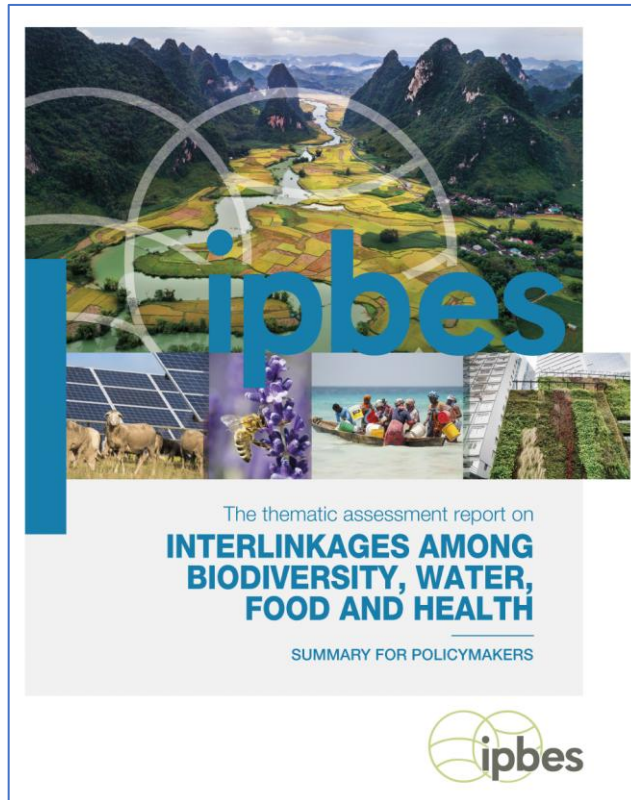


Les enjeux liés au changement climatique dans le rapport IPBES Nexus

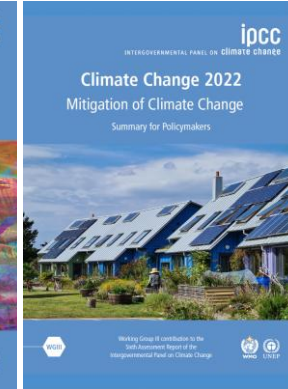
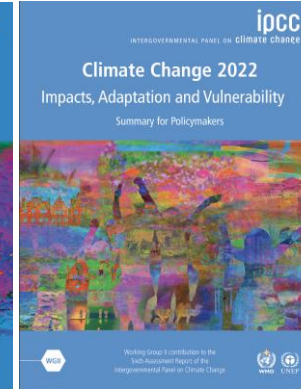
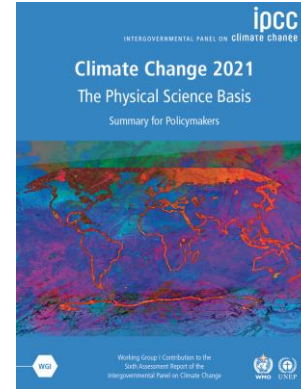
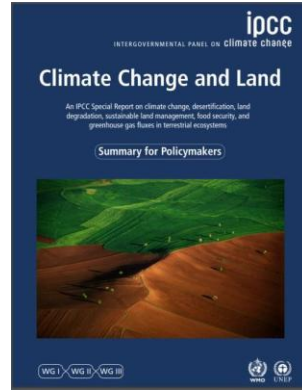
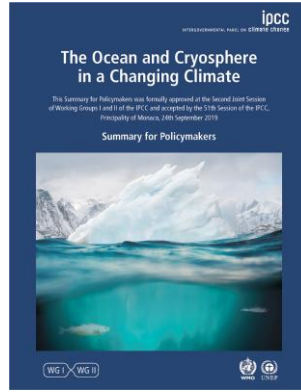
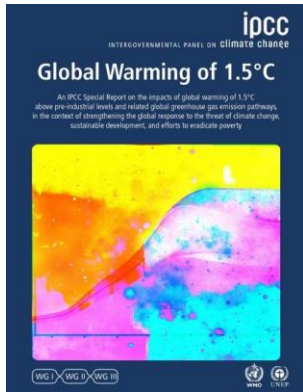


<https://wmo.int/publication-series/state-of-global-climate-2024>

Valérie Masson-Delmotte

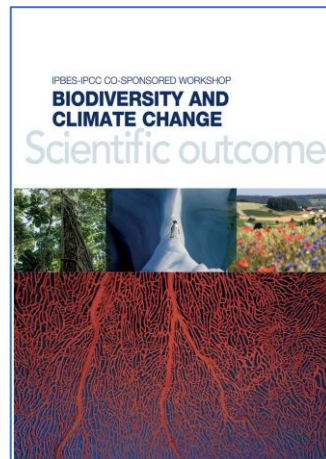
Institut Pierre Simon Laplace
Laboratoire des Sciences du Climat et de l'Environnement (CEA-CNRS-UVSQ),
Université Paris Saclay

Liens avec les évaluations scientifiques liées au changement climatique

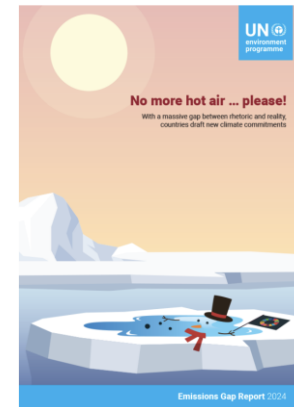


AR6 GIEC (IPCC)

IPCC-IPBES

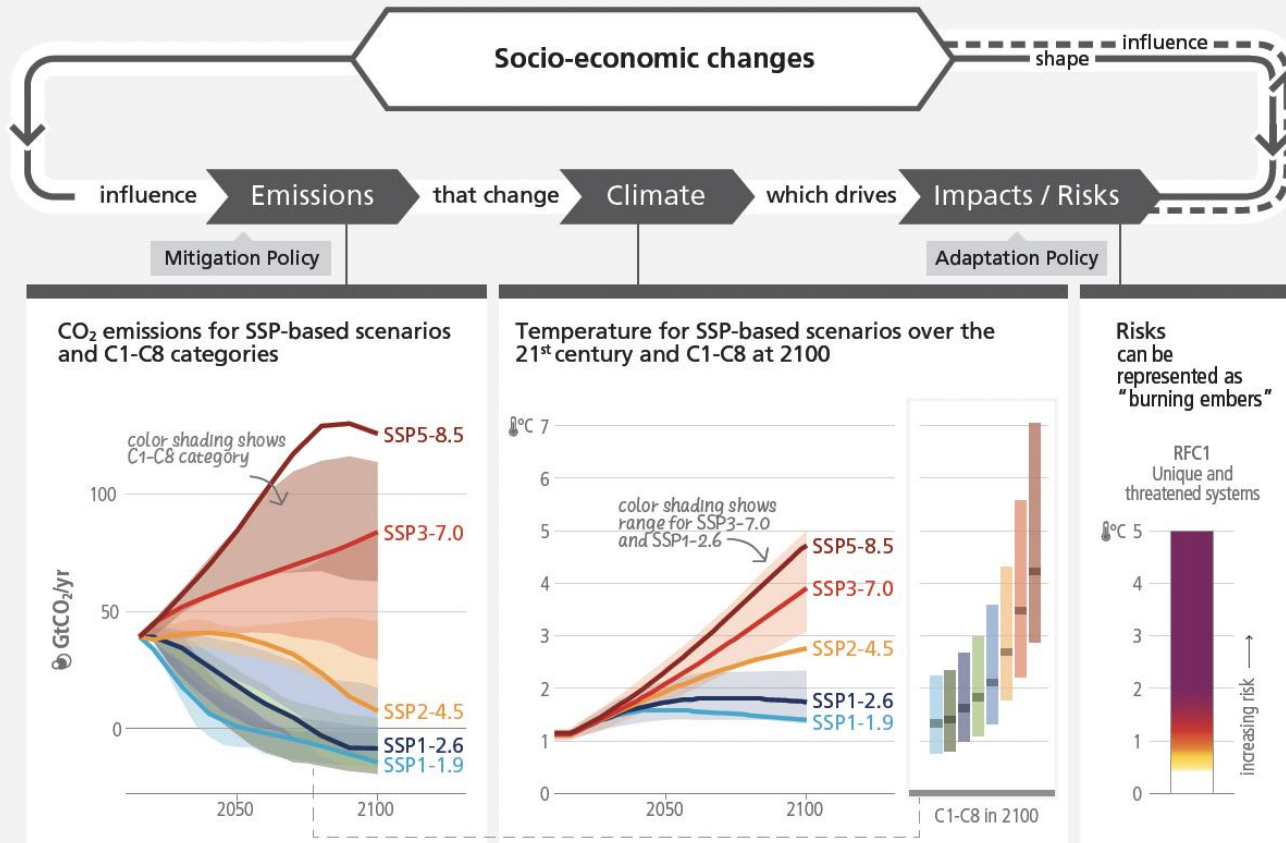


UNEP emission gap reports



Scenarios and warming levels structure our understanding across the cause-effect chain from emissions to climate change and risks

a) AR6 integrated assessment framework on future climate, impacts and mitigation



Liens avec les évaluations scientifiques liées au changement climatique

Response options based on land management

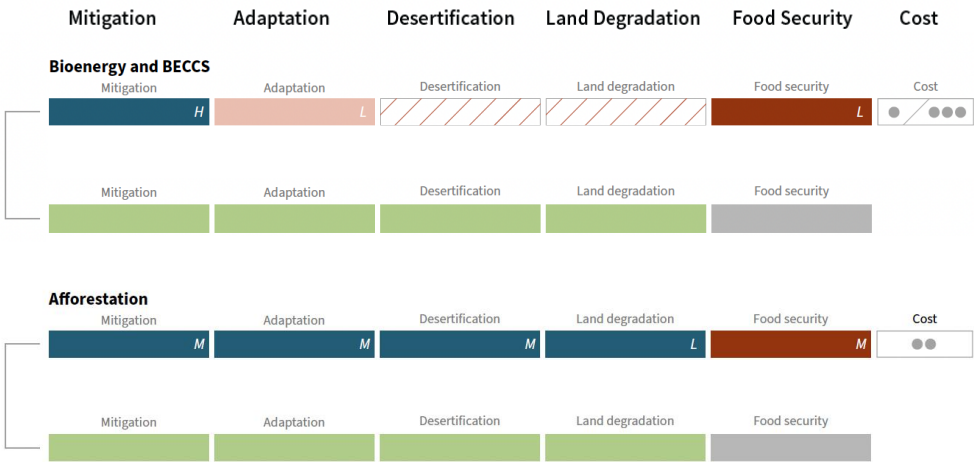
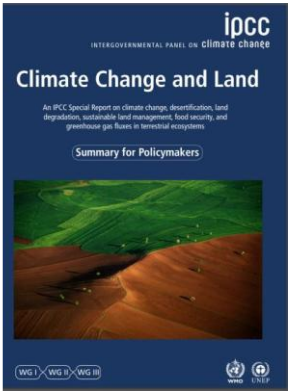
Agriculture	Increased food productivity
	Agro-forestry
	Improved cropland management
	Improved livestock management
	Agricultural diversification
	Improved grazing land management
	Integrated water management
Forests	Reduced grassland conversion to cropland
	Forest management
	Reduced deforestation and forest degradation
Soils	Increased soil organic carbon content
	Reduced soil erosion
	Reduced soil salinization
Other ecosystems	Reduced soil compaction
	Fire management
	Reduced landslides and natural hazards
	Reduced pollution including acidification
	Restoration & reduced conversion of coastal wetlands
	Restoration & reduced conversion of peatlands

Response options based on value chain management

Demand	Reduced post-harvest losses
	Dietary change
	Reduced food waste (consumer or retailer)
Supply	Sustainable sourcing
	Improved food processing and retailing
	Improved energy use in food systems

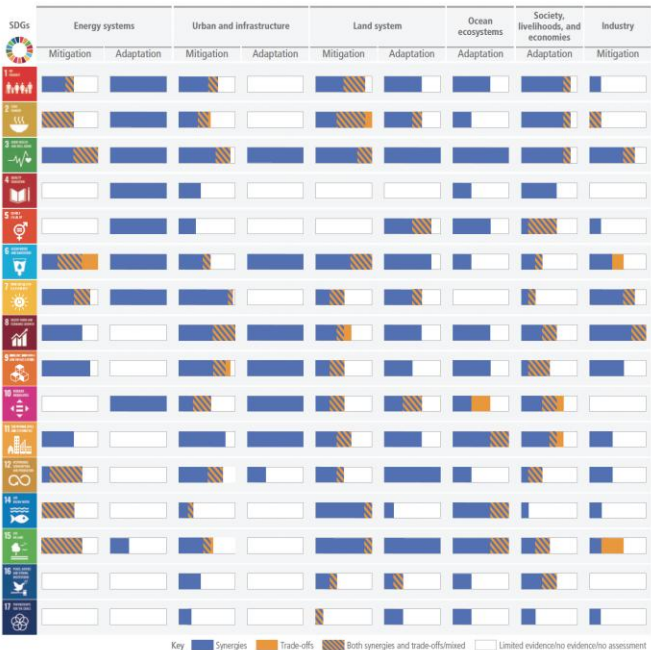
Response options based on risk management

Risk	Livelihood diversification
	Management of urban sprawl
	Risk sharing instruments

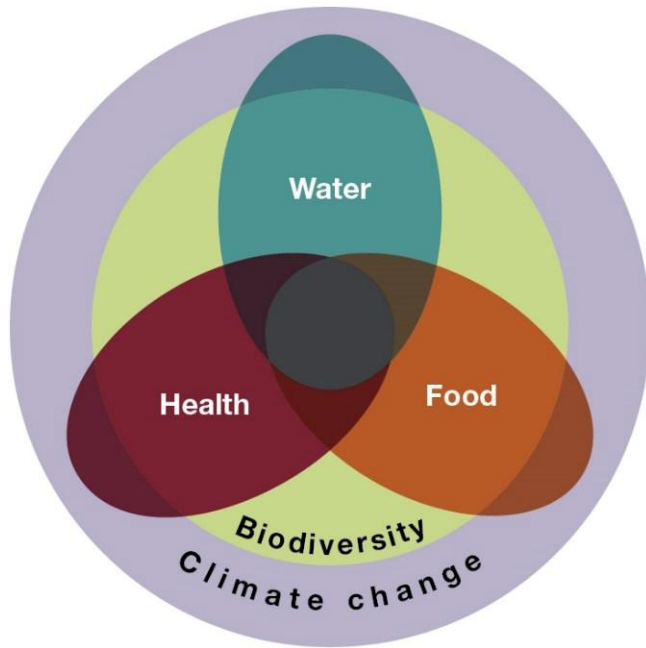


Near-term adaptation and mitigation actions have more synergies than trade-offs with Sustainable Development Goals (SDGs)

Synergies and trade-offs depend on context and scale



(certains auteurs en commun)



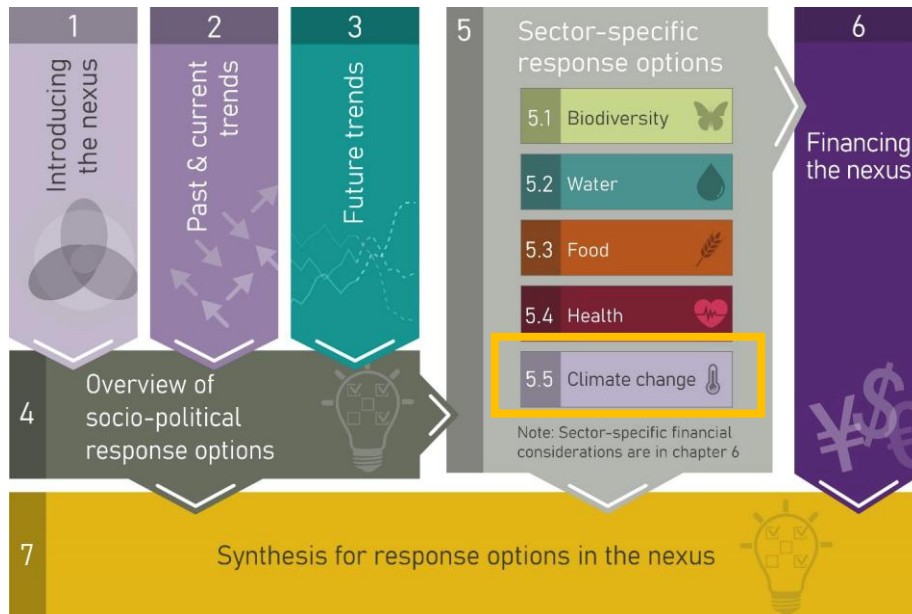
Structure du résumé pour décideurs

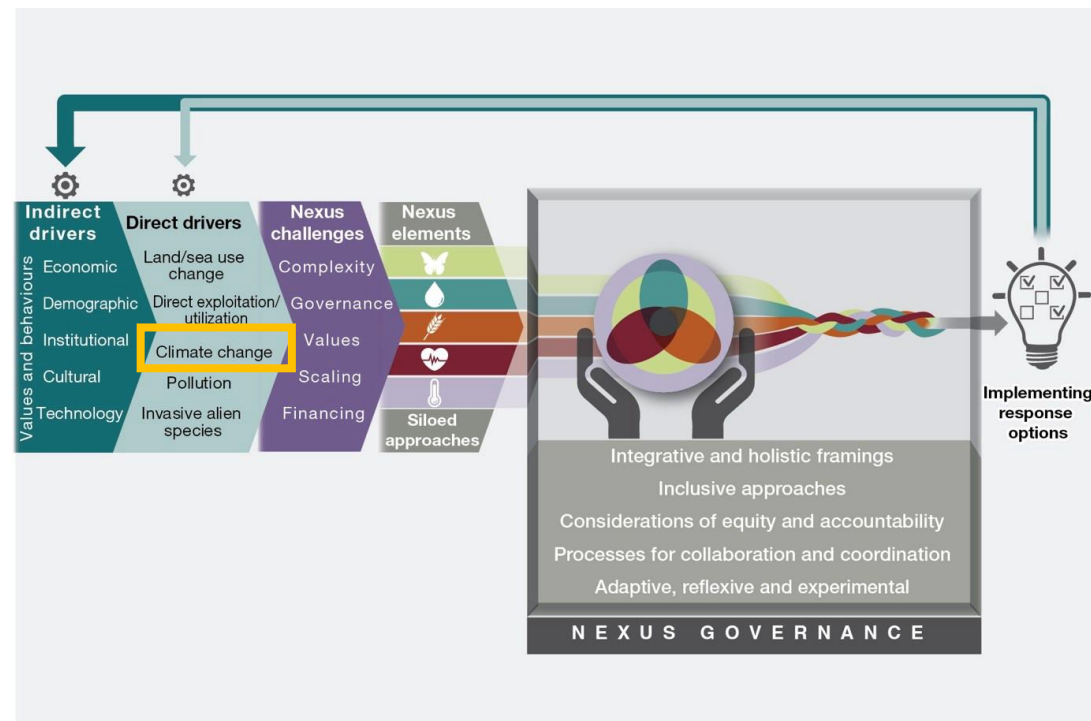
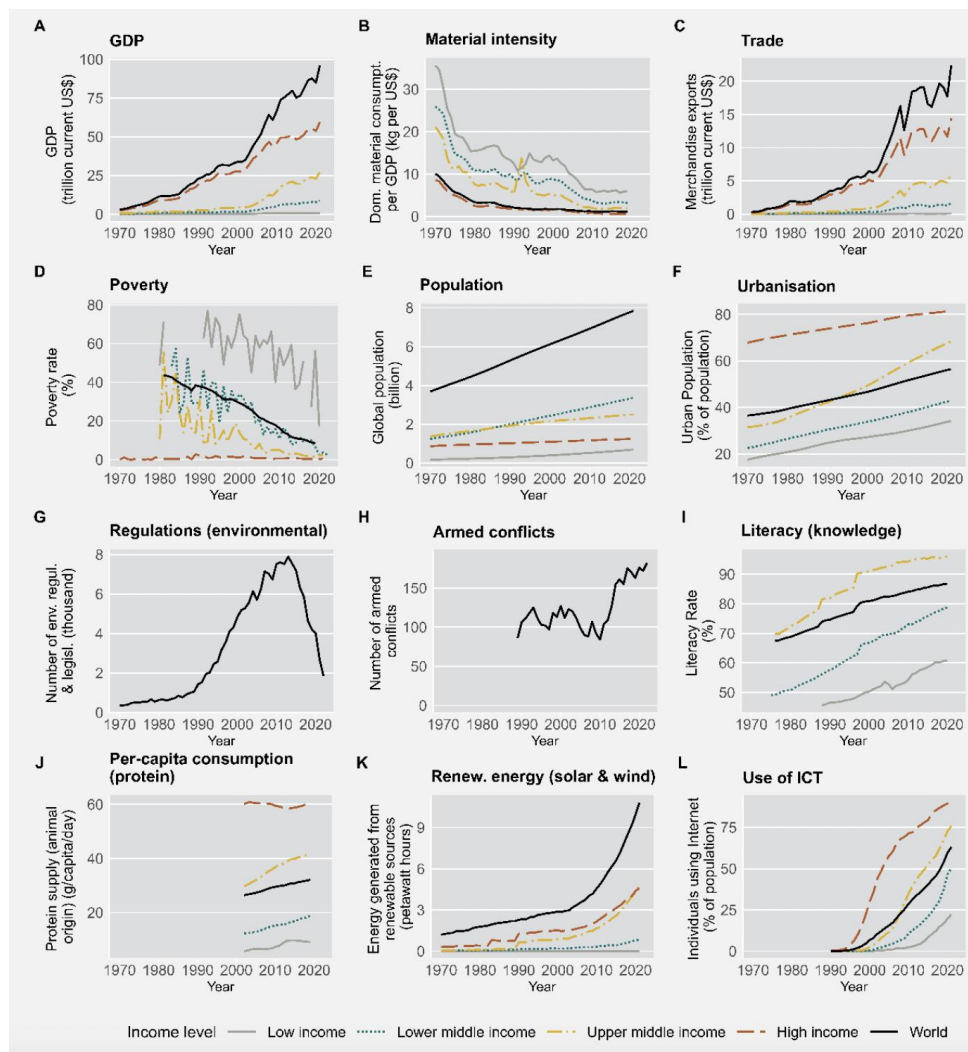
Interactions passées et actuelles

Interactions futures du nexus

Options de réponse qui tiennent compte des interactions du nexus

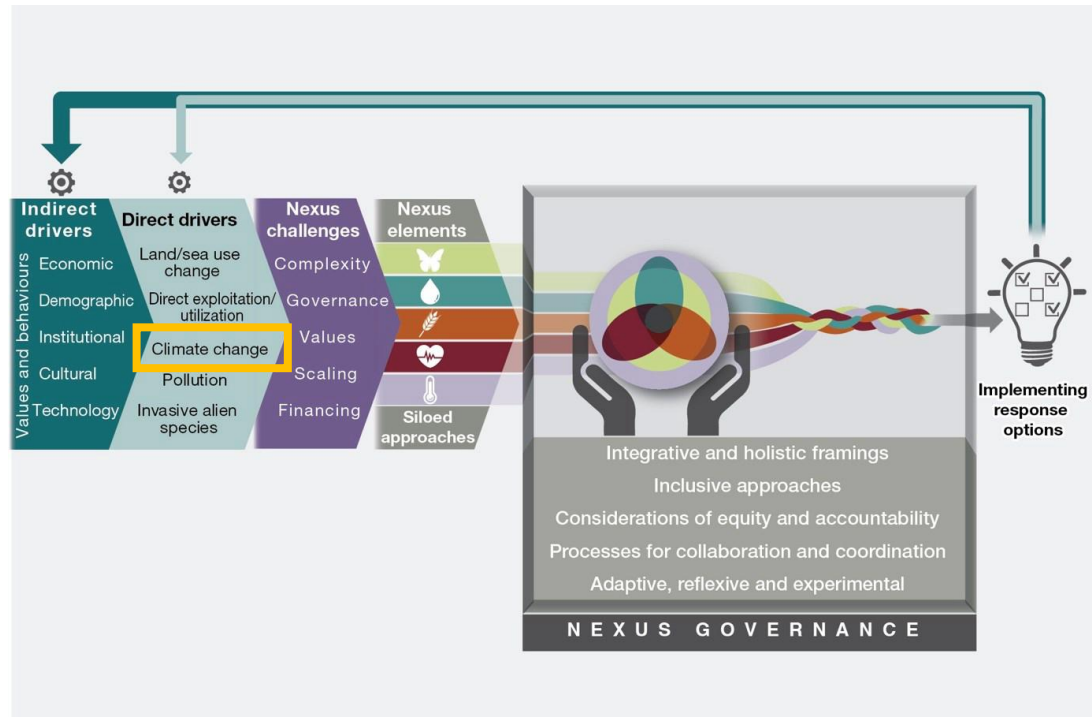
Gouvernance du nexus pour des futurs justes et soutenables





+ énergies fossiles

90% des émissions de CO₂, 50% de la hausse des émissions de CH₄



A TRENDS IN INDIRECT DRIVERS AND THEIR IMPACTS ON TRENDS IN DIRECT DRIVERS

Indicators of indirect driver		Trend in indirect driver	Impact on trend in direct driver				
			Land/sea use change	Unsustainable exploitation	Climate change	Pollution	Invasive alien species
Economic	GDP	↑	↑↑	↑↑	↑↑	↑↑	↑
	Material intensity	↘	—	↓	↓	↓	—
	Trade	↑	↑↑	↑↑	↑	↑	↑↑
	Poverty	↓	—	—	—	—	—
Demographic	Population	↗	↑↑	↑↑	↑↑	↑↑	—
	Urbanization	↗	↑	↑	↑	↑	↑
Institutional	Regulations (environmental)	↑	—	—	—	—	—
	Armed conflicts	↑	~	~	↑	↑	—
Cultural	Knowledge/literacy	↗	—	—	—	—	—
	Per capita consumption	↗	↑↑	↑↑	↑↑	↑↑	↑
Technology	Renewable energy (solar and wind)	↑	↑	↑↑	↓	~	—
	Use of ICT	↑	—	↑↑	~	↑	↑

B TRENDS IN INDIRECT DRIVERS AND THEIR IMPACTS ON NEXUS ELEMENTS

Indicators of indirect driver		Trend in indirect driver	Biodiversity	Water		Food		Health		Climate change
				Availability	Quality	Quantity	Quality	Physical	Mental	
Economic	GDP	↑	↓	↓	↓	▲	▼	▼	▼	↑↑
	Material intensity	↘	—	—	—	▲	—	—	—	↓
	Trade	↑	↓	↓	↓	▲	▼	▼	▼	↑
	Poverty	↓	—	?	—	?	?	?	?	—
Demographic	Population	↗	↓	↓	↓	▲	▼	▼	▼	↑↑
	Urbanization	↗	↓	↓	↓	▲	?	▼	▼	↑
Institutional	Regulations (environmental)	↑	▲	▲	—	—	—	—	—	—
	Armed conflicts	↑	?	—	—	—	↓	↓	↓	↑
Cultural	Knowledge/literacy	↗	—	—	—	—	—	—	—	—
	Per capita consumption	↗	↓	↓	↓	▲	▼	—	—	↑↑
Technology	Renewable energy (solar and wind)	↑	↓	—	—	?	—	?	—	↓
	Use of ICT	↑	↓	—	—	—	—	▼	—	?

Trend characterization, annual growth rate since 2001

↑	> +3%
↗	0.3 to 3%
→	-0.3 to 0.3%
↘	-0.3 to -3%
↓	< -3%

How trend in indirect driver impacted trend in direct driver

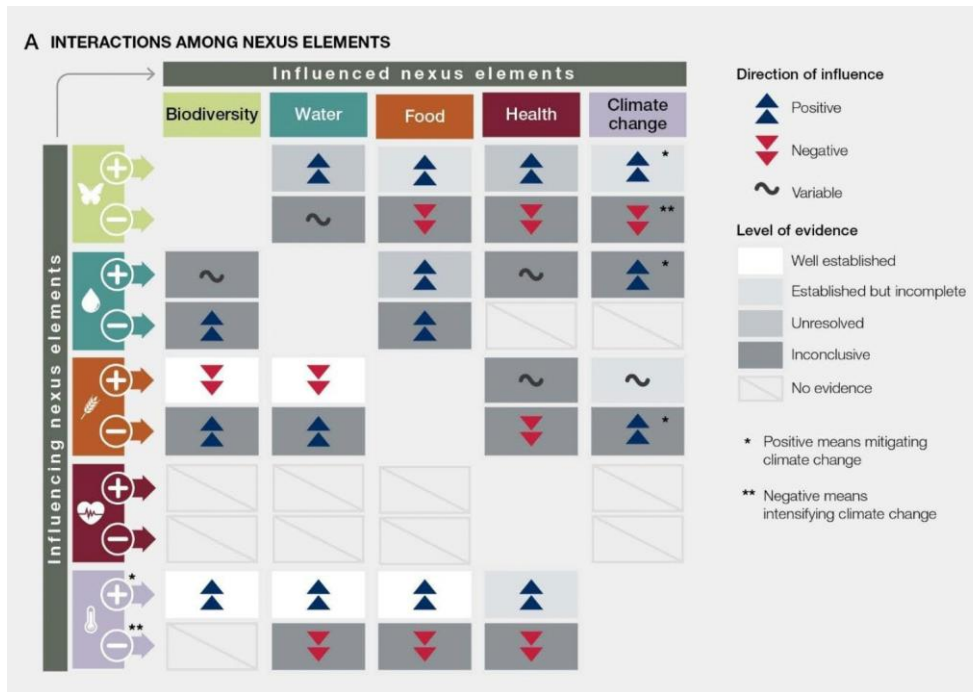
↑↑	Intensification
↑	Modest intensification
—	Stable/little to no impact
↓	Small reduction
↓↓	Large reduction
~	Variable

How trend in indirect driver impacted trend in nexus element

↑↑	High positive impact
↑	Moderate positive impact
—	Stable/little impact
↓	Moderate negative impact
↓↓	High negative impact
~	Variable

Level of evidence of impact

Well established
Established but incomplete
Unresolved
Inconclusive



- Le changement climatique menace tous les éléments du nexus
- Une atténuation efficace, rapide, soutenue et l'accélération de la mise en œuvre d'actions d'adaptation ont le potentiel de bénéfices pour tous les éléments du nexus à condition de minimiser les effets indésirables et de stimuler les synergies
- Transitions rapides cruciales pour favoriser atténuation, adaptation et développement durable : systèmes de production et usage de l'énergie, gestion des terres et écosystèmes marins et terrestres, systèmes urbains et industriels, sociétés
- Besoin de renforcer les partenariats et engagements pour le financement, le transfert et le déploiement de technologies bas carbone
- 15 options de réponse évaluées / éléments du nexus

 Climate change response option	Response option classification				
	Land & oceans ecosystems transitions	Energy systems transitions	Settlement & infrastructure systems transitions	Industrial systems transitions	Social systems transitions
C01 Increase soil organic carbon	✓				
C02 Sustainable intensification	✓				
C03 Integrated multi-trophic aquaculture	✓				
C04 Wetland conservation and restoration	✓				
C05 Offshore wind power		✓			
C06 Solar photovoltaics on land		✓			
C07 Circular bioeconomy				✓	
C08 Reduce short-lived climate pollutants		✓			
C09 Multi-hazard early warning systems					
C10 Global cooperation for finance and technology					
C11 Agroecology	✓				
C12 Forest-based climate solutions	✓				
C13 Restoration of blue carbon ecosystems	✓				
C14 Integrated urban nature-based solutions			✓		
C15 Sustainable healthy diets					✓

Biodiversity		Water		Food			Health			Climate change	
Change in function	Change in state	Water for ecosystems	Water for humans	Access to healthy food	Environmental performance of food production	Food availability and production	Access to quality healthcare	Burden of disease	Well-being	Adaptation impact	Mitigation impact

Social acceptability		Alignment with political priorities		Alignment with international frameworks			Economic implications				Equity			Transformative change potential		
Political support	Positively affects vulnerable groups	Existing policies	Included in national priorities	SDGs	GBF	Paris Agreement	Economic benefits	Economic risks	Gross economic costs	Individual economic costs	Distributional equity	Inclusion and/or recognition	Procedural equity	Social, cultural and technical innovation	Structures and institutions	Views and values

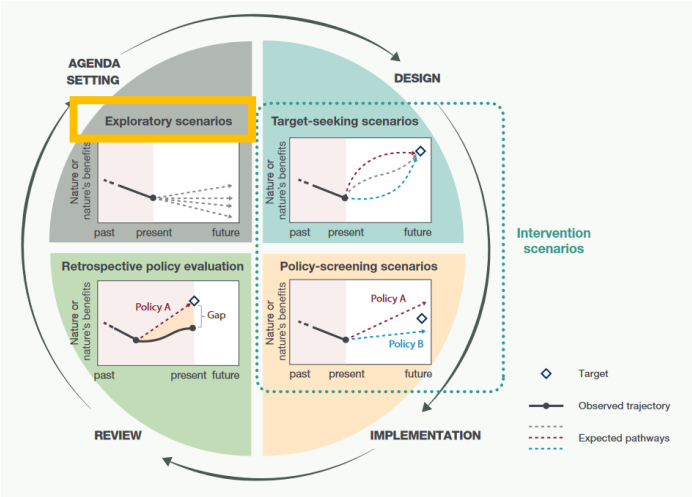
Actors										
Global and regional institutions	National governments	Local governments and municipalities	Knowledge and educational communities	Civil society organizations	Community-based organizations	IPLC	Private sector and business organizations	Science-policy interfaces	Financing institutions	Media and the arts

Enablers and barriers							
Policy design and implementation	Equity and diversity	Institutional capacity	Finance and economics	Behaviour and lifestyle	Technology	Material endowments	Indigenous and local knowledge

Ethical contexts for consideration	Values potentially resonating with public opinion	Worldviews offering philosophical anchors
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+ key knowledge gaps

Scénarios orientés climat et leurs interactions avec le nexus



Climate	Climate change impacts	Scenarios exploring future impacts of climate change across the nexus
	Climate change mitigation	Scenarios exploring nature-based solutions to climate change mitigation across the nexus
	Climate change adaptation	Scenarios that explore alternative options for adapting to future climates across the nexus

Climate action pathway	Climate change	Biodiversity	Water	Food	Health
No climate action beyond current policies, or even less climate action					
Business-as-usual (BAU)	Unabated global warming to +2.8°C or more, with risk of reinforcing effects from biodiversity degradation	Decreasing global biodiversity trends from habitat conversion, overexploitation, etc. and accelerated in the second half of the century by unabated climate change	Mostly negative impact as water is affected by climate change, increasing scarcity and pollution	Negative impacts from climate change increasing in the long run with potential short-term benefits in some regions; food security risks potentially reduced by increased food production in the short run but also affected by other factors	Projected negative impacts from extreme climate events on health (e.g., heatwaves), plus indirect negative effects on nutrition, infectious diseases and mental health. Potential health co-benefits of climate change mitigation not realised
Delayed Action (DEL)	Increased climate action ambition but starting late, not including demand / lifestyle changes measures, and not considering potential adverse effects on other nexus elements. Due to delayed action and limited reliance on demand measures and lifestyle changes, pressures on land and water resources increase (i.e., higher negative emissions are required and food / energy consumption remain high). Mitigation measures are not designed in an integrated fashion and entail missed opportunities (e.g., weak protection of ecosystems) and large risks to other nexus elements (e.g., large development of biofuels). Chances to reach climate mitigation well below 2°C are limited.				
	Limited global warming to +2°C	Risk of trade-offs from large reliance on biodiversity-unfriendly climate action (large afforestation and biofuels) and negative impacts from residual climate change	Risk of trade-offs from large reliance of water-unfriendly climate action (large afforestation and biofuels) and negative impacts from residual climate change	Potentially larger negative impacts from mitigation impact than avoided climate change	Most of the above-mentioned negative impacts remain, apart from avoided climate change impacts

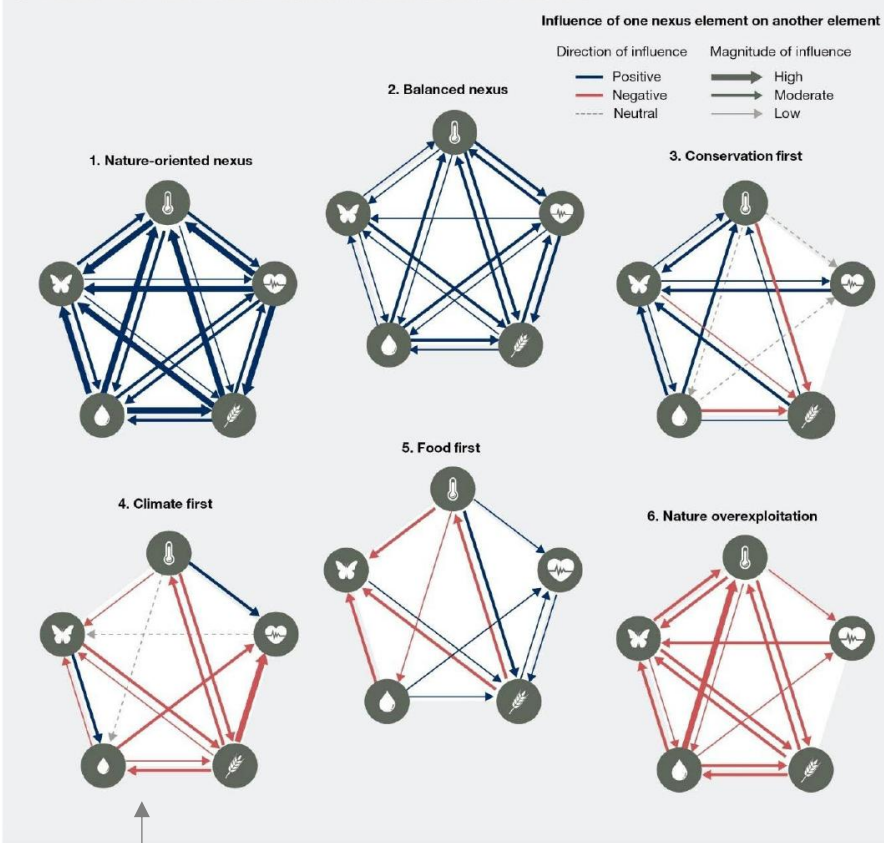
fortes pressions sur les terres

Climate action pathway	Climate change	Biodiversity	Water	Food	Health
Sustainable Development Pathway (SDP)	Increased climate action ambition starting rapidly, including demand / lifestyle changes measures and explicitly considering potential adverse / synergistic effects on other nexus elements. Due to early action and reliance on demand measures and lifestyle changes, pressures on land and water resources decrease (i.e., a limited amount of negative emissions are required and food / energy consumption decrease to more sustainable levels). Mitigation measures are designed in an integrated fashion and entail mobilization of synergistic options (e.g., strong protection of ecosystems) and avoidance of solutions detrimental to other nexus elements. A high level of coordination across spatial scales is achieved, allowing solutions to be tailored to local contexts. Chances to reach climate change mitigation well below 2°C are increased.				
	Limited global warming well below +2°C	Positive synergistic effects from reduced pressure from unsustainable consumption, climate action prioritizing ecosystem protection and restoration, limited	Positive synergistic effects from reduced pressure from unsustainable consumption, climate action avoiding increased pressure (but	Positive synergistic effects from reduced pressure from unsustainable consumption and sustainable healthy diets, avoided climate change impacts	Positive synergistic effects from reduced climate extremes, effective adaptation measures, improved food and water security, avoided infectious and
		negative impacts from residual climate change	some trade-offs associated energy transition might remain), limited negative impacts from residual climate change		non-communicable diseases. Health co-benefits of mitigation policies (reduced non-communicable disease attributable to improvements in diet, physical exercise and air pollution)

A PROJECTED FUTURE IMPACTS ON THE NEXUS ELEMENTS

Nexus archetype	Nexus element					Impacts on each nexus element under each nexus archetype
	Biodiversity	Water	Food	Health	Climate	
1. Nature-oriented nexus	▲▲▲	▲▲	▲	▲	▲▲	▲▲▲ Highly positive
2. Balanced nexus	▲	▲	▲	▲	▲	▲▲ Moderately positive
3. Conservation first	▲	~	▼	~	▲	▲ Slightly positive
4. Climate first	▼	~	▼	▲	▲▲	~ Variable
5. Food first	▼	▼	▲	▲	▼	▼ Slightly negative
6. Nature overexploitation	▼	~	▼	▼	▼	▼ Moderately negative
						▼ Highly negative

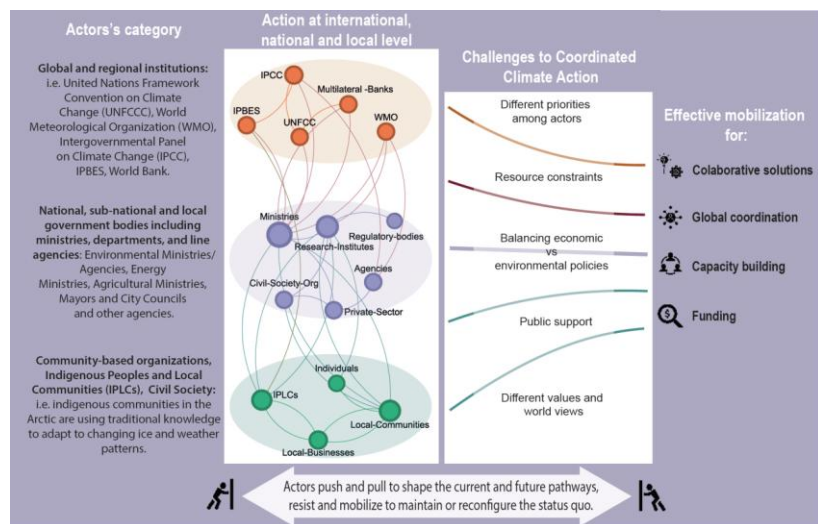
B INTERACTIONS AMONG NEXUS ELEMENTS FOR EACH NEXUS ARCHETYPE



- Un changement transformateur vers un futur résilient face au changement climatique est rendu possible par :
 - le regroupement et le séquençage de ces options de réponse,
 - le renforcement de leurs synergies et la gestion des compromis avec les autres éléments du nexus

 Climate change response option	Sustainable Development Goal																	Global Biodiversity Framework Target																							Paris			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
C01 Increase soil organic carbon																																												
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C14 Integrated urban nature-based solutions																																												
C15 Sustainable healthy diets																																												

competition for land and other resources between climate change mitigation actions and the other nexus elements, if actions are not planned in an integrated way



- Modèle de gouvernance polycentrique, collaboration d'acteurs étatiques et non étatiques, **cohérent avec la gouvernance du nexus**, mix d'instruments économiques, financiers, juridiques et réglementaires
- Responsabilité collective et solidarités renforcées par l'intégration des dimensions liées aux droits, à l'éthique, aux valeurs et visions du monde – équité et justice climatique, transitions justes
- Approches fondées sur les droits, les processus de participation inclusifs : l'intégration des savoirs locaux et autochtones dans les initiatives climatiques renforce l'adaptation, l'atténuation et la résilience des systèmes, contribuant à la préservation de l'eau, des forêts, de la biodiversité, la sécurité alimentaire et la santé, en encourageant les visions du monde et systèmes de valeurs alternatifs

Policies/ procedures	Inclusion	Biodiversity	Water	Food	Health	Energy	Climate action	Key actors
Legal and regulatory								
Implementation of NDCs	Achieving economy-wide targets under country submissions	+1	+2	+1	+1	+3	+3	National governments, non-state actors, private sector
Integration of national climate and biodiversity action plans	Synergizing policies at national and local levels for effective and efficient implementation	+3	+1	+2	+1	0	+3	National governments
Implementation of SDG 13	Resilience, adaptive capacity, mainstreaming into national policies, awareness	+3	+2	+3	+2	+3	+3	National governments, non-state actors, private sector
National adaptation plans	Focusing on adaptation sectors such as forestry, water, health, food	+3	+3	+3	+3	+1	+3	National, local and city governments, citizens
Economic and financial								
Climate-related financial disclosures (TCFD)	Disclosure framework for businesses and financial institutions to assess and disclose climate-related risks and opportunities	+1	+3	+3	+3	+2	+3	Businesses, state and local governments
Integrated finance for climate and biodiversity (GBF 19E)	Streamlining finance to achieve multiple objectives	+3	+3	+3	+1	+1	+3	Financing institutions, national government, policymakers
Accounting of ecosystem services	Comprehensive evaluation of ecosystem services for climate, food, health and biodiversity to implement NIS	+3	+3	+3	+1	0	+3	Local communities, practitioners, civil society, government
Market-based mechanisms (Article 6 PA)	Carbon pricing and mainstreaming in all sectors	+1	0	+1	0	+3	+3	Private entities, governments
Green bonds	Invest in climate solutions through a high-quality credit fixed income product	+1 (Contextual)	+1	+2	+1	+3	+3	Private sector, development banks, resource users
REDD+ (Results-based payments)	Real, measurable, long-term and additional carbon sequestration stabilization	+3	+2	+3	+2	0	+3	National governments, resource users, IPLC, Private sector
Payment for ecosystem services (PES)	Reducing emissions from deforestation, eco-tourism, protected areas, clean water	+3	+3	+1	+3	+1	+3	Local communities, sub-national and national governments, NGOs
Reduction of harmful subsidies	Reducing subsidies that result in high trade-offs	+3	+2	+2	+3	-2	+1	National government, international trade entities
Rights-based and customary								
Non-market approaches (Paris Agreement Article 6)	Mainstreaming sustainability at an economy-wide scale	+3	+1	+3	+2	+3	+3	National and local governments, civil society, private sector
Other effective area-based conservation measures	Conserving and restoring lands, marine and coastal ecosystems to build climate resilience	+3	+3	+2	+3	0	+3	MEAs, national and sub-national governments, civil society, IPLC
Local governance/ local and Indigenous Peoples rights for climate resilience	Empowering grassroots, IPLC, women and youth into decision-making	+3	+3	+3	+3	0	+3	National and local governments, IPLC, women, youth
Indigenous and local knowledge registers	Documenting TLK, creating data platforms and securing access and benefit sharing to build climate resilience	+3	+2	+3	+3	+1	+3	IPLC, national and local governments
Socio-cultural approaches								
Ecosystem and community-based adaptations (EbA and CbA)	Empowering grassroots, IPLC, women and youth into decision-making	+3	+3	+3	+3	+1 *	+3	National and local government, IPLC, women, youth
Religion and culture-driven nature protection	Sacred landscapes, biocultural diversity and conservation linked to culture and religion. Protects carbon stock	+3	+3	+2	+3	0	+3	IPLC, local governments
Participatory/ Co-management	In addition to implementation and monitoring, community is engaged in planning the interventions, acting as a decision-maker	+3	+2	+3	+2	+1	+3	Community/IPLC, resource users, civil society, local governments
Capacity development	Developing capacities of the community through economic and social support systems	+2	+2	+3	+3	+1	+3	Civil society, local governments, IPLC, international organisations
Education, and awareness/ Action for climate empowerment (ACE)	Creating awareness on resource use through education and training	+3	+2	+2	+2	+2	+3	Civil society, local governments, international organisations

- Modèle de gouvernance polycentrique, collaboration d’acteurs étatiques et non étatiques, cohérent avec la gouvernance du nexus, **mix d’instruments économiques, financiers, juridiques et réglementaires**
- Responsabilité collective et solidarités renforcées par l’intégration des dimensions liées aux **droits, à l’éthique, aux valeurs et visions du monde** – équité et justice climatique, transitions justes
- Approches fondées sur les droits, les **processus de participation inclusifs** : l’intégration des **savoirs locaux et autochtones** dans les initiatives climatiques renforce l’adaptation, l’atténuation et la résilience des systèmes, contribuant à la préservation de l’eau, des forêts, de la biodiversité, la sécurité alimentaire et la santé, en encourageant les visions du monde et systèmes de valeurs alternatifs

- Mettre en priorité les politiques qui tiennent compte des défis interconnectés (climat, biodiversité, dégradation des terres, pollution, insécurité alimentaire, accès à l'eau et l'énergie pour tous, développement durable) délivre une action climatique plus efficace

