Chapter 18: Climate Resilient Development Pathways

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Table SMCCB GENDER.1: Interrelations between SDG5 (gender equality) and adaptation initiatives in 9 major sectors

Sector	*SDG 5 (net impact)*	*Main messages*
Terrestrial	**+ (enabling)**	+Community-based natural resource management increases the participation of women, most likely if they are organised into women groups. +National forest conservation/reforestation programs (e.g through CDM and REDD+) and forest sequestration programs can improve the family and social status of women and the creation of women's group in forest conservation programs can create more income for women and new connections which increases women's leadership and power in the local context. -However, too restricted rules of REDD+ that do not include traditional uses from local communities can hamper women and girls' traditional activities. - Payment for ecosystem services in the 'forest protection' category based on property size reduce women income as compared to men because women tend to have smaller size of the property ±Engagement in aquaculture has the potential to bring respect and popularity to women, if they succeed which depends on the gendered approach in introducing any technology otherwise the gender gap can increase, despite the many potential benefits of such technology.
Ocean	**- (counteracting)**	-Marine Protected Areas tend to reproduce existing gender disparities in relation to leadership and power. Research on MPAs in Kenya, Tanzania, Madagascar, Indonesia and the Philippines has concluded that women are less likely to participate in MPA governance and activities because MPAs restrict fishing and women have to find other sources of income to support their families. - Decision-making in relation to a mangrove restoration project: women's participation was low as they were not informed of focus group discussion. Also, in some places, men were culturally deterred from participating in mangrove restoration activities due to the low associated pay which was felt to be more suitable for women. +Workshops conducted in the Pacific highlighted how women are taking the lead in a range of local-scale adaptation actions that innovate as well as build on traditional knowledge. ±In sustainable aquaculture practices, gender roles are clearly defined. Women are not directly involved in commercial activities and almost all those involved in subsistence aquaculture are female due to the perceived lack of immediate economic gains. However, aquaculture provides opportunities for income diversification for both women and men
Mountain	**+ (enabling)**	+Being pushed into new roles, domains and spaces, women's skills and capacities have increased. Strategies adopted to address domestic water scarcity

		by conserving and recycling water are strengthening women's role in the community. +Women are engaged and recognized for such preparatory measures in advance of floods to stock up on essential items such as grains, oil and kerosene, as well as drying fish and vegetables for future use +Investment in education systems, programmes on women empowerment, pro-poor policies on access to affordable credit facilities, social protection schemes for the vulnerable and access to markets especially for livestock are likely to enhance both men and women adaptation. -Changes in gender roles to respond to climatic and socioeconomic stressors is not supported by institutional practices, mechanisms and policies that remain patriarchal. -Adaptation strategies adopted do not change or exacerbate the incidences of violence against women and children, which remain as the root cause of increased vulnerabilities. -Female-headed households are more vulnerable as they are less likely to adopt technologies because female heads have less access to information and other resources (including financial) due to traditional barriers.
Food	**+ (enabling)**	+Women's power to participate in intrahousehold adaptation decision-making is significantly correlated with their livelihood diversification through non-farm income earnings. +Women have reported that by implementing Best Management Practices (BMPs), changes were experienced in multiple domains, such as financial and physical capital, better nutrition (more food available to eat) and improved health care, as well as gaining more social and human capital. +Agroecological training in farming communities seems to increase gender-related sensitivity increasing girls schooling opportunities. +Access to ICT facilities enhances the resilience of women households by connecting them to new opportunities by increasing agricultural production incomes. + With well-organized water collection management, women and marginalized groups have equitable access to water springs, which was timesaving for them. -But the water infrastructure (micro-watershed) did not take the safety aspect for women and children into account to minimize accident risk. -Mobile phones are critical for access to Climate Information System but women perceive limited impact as they face some challenges that prevent them from accessing mobile phones like low-income levels, lack of training, inability to interpret climate information and convert it into actions, limited access to mobile phones (mostly by women), and inability to afford to call credits. Therefore, the design and delivery of climate information services need to be both relevant to the specific context and gender-sensitive in content
Water	**+ (enabling)**	+ Women experienced enhanced respect and trust through a hygiene and sanitation transformation approach, where the participatory programmes included men, women, and girls. + Improved water and sanitation facilities have shown to increase enrolment as well as reduce repetition and dropout rates for girls in school and higher education of women is shown to be correlated with reduced incidence of diarrhoea. + Infrastructure that is developed to respond to natural disasters and take into account gender-specific needs, such as sanitation facilities, can create security and safety for women and girls and provide a place to gather for support and foster empowerment + In developing countries, women are responding to water scarcity through collection adaptations, such as small rainwater harvesting systems and storage tanks, greywater recycling systems, fog water collection. These adaptation measures reduce physical burden and time commitment spent on collecting water, therefore increasing time to be spent on other activities such as school + Women play a significant role in response to natural disasters and when they are involved in pre-disaster planning, space is created to address women's-specific needs, such as building sanitation facilities above the flood line + In adapting to climate variability, women use unique storage practices to manage water resources; this includes storing water in cool, dark areas, using plastic containers or rooftops and underground tanks. Also, fog harvesting is an

🟩		innovative water storage technique that alleviates the physical and social burden of water collection on women and girls - When women travel further distances to collect water it puts their safety at risk including exposure to violence and sexual assault. - Lack of access to adequate hygiene and sanitation facilities often restricts women and girls from fully participating in the job place or regularly attending school
🟥 **Poverty**	**- (constraining)**	+ Women are experimenting and driving innovative adaptation options such as homestay-based ecotourism and fruit farming present promising adaptation strategies that are being taken up by others in the community -But patriarchal institutions and structural discriminations result in less access to services, economic resources as compared to men, including less control over income, fewer productive assets, lack of property rights, less access to credit and less access to irrigation, climate information, seeds, and lead to devaluation of women's farm-related adaptation options. - Continued exclusion of women's ideas and views from policy processes will inhibit adaptation and may lead to discriminatory outcomes - Female care workers from the global south entering global care chains, leave a care gap in the places they are migrating from, adding additional care burdens to those [women and girls] who remain behind - A feminist political economy view of disaster recovery across four empirical case studies (United States, Thailand, Philippines, and New Zealand) shows that processes of enclosure, exclusion, encroachment, and entrenchment can distort disaster-relief supports and safety nets, to preserve or exacerbate gender, class, and ethnic disparities Formalizing women's land registration and adopting equitable business models and policies are needed. Prompt attention is needed to address structural social inequalities and gendered power relations during disaster recovery.
🟩 **Cities**	**+ (enabling)**	+Urban agriculture has positively impacted women's participation by improving their wellbeing, food security, and income by increasing their social capital and also allows women to more efficiently and successfully perform their gender roles and responsibilities and gain social and economic empowerment +Well-designed transit-oriented development have positive impacts on gender equality including women's freedom of movement and security +ICT programs that explicitly target women address their specific vulnerabilities have shown to have positive impacts on women's livelihoods and wellbeing, expanding their socio-economic, physical and political space -In houses poorly adapted to heat, women experience higher impacts of extreme heat because culturally, women have limited mobility outside the home and effective techniques to reduce indoor temperatures are not available (except air-conditioning at night and low-cost techniques at daytime for some people) -Current urban policies around climate resilience do not recognise address structural barriers to gender participation such as inadequate recognition of women's unpaid work, inadequate participation, and leadership in decision-making -Relocation can also force women into lowly paid jobs or informal economy, creating a vicious circle where women's time poverty further reduces their social capital and opportunities for self-development in terms of education or formal employment
🟥 **Industry**	**- (constraining)**	-Male workers had a significant increase in overall claims during moderate-severity heatwaves, while no significant change was observed for female workers. -Women find it difficult to carry out the strenuous physical activity during menstruation and unequal wages distribution creates additional threats to cope with their health problems. ±There should be a separate neat and clean toilet for the women workers in workplaces. Wherever possible the eligible women workers should be given maternity benefits in industrial and organised sectors. Exhaustive and comprehensive legislation is urgently needed for regulating working conditions, wage structure, welfare measures of the women workers. Communication through self-help groups of women and NGOs is needed for the receptivity among workers and employers.

🟥		±There are many women groups and NGOs which work with migrant populations in the unorganised sector. Empowering these groups with the relevant latest IEC materials would enable them to fight the heatwave
Health	**+ (enabling)**	+Village savings and loans and other microcredit programs that focus on women can increase their access to credit, income, social networks, adaptive capacity and improve women's overall well-being. +Some climate change adaptation policies explicitly address violence against women and girls that can increase during disasters or drought +Maternal education can significantly reduce the risk of child malnutrition in a post-flooding event or post-drought. +Climate change policies which address mitigation and adaptation can improve women's well-being and mental health, through mechanisms such as increased access to green spaces, reduced air pollution, increased use of bicycles and walking as transport. +Engaging men and boys in addressing gender inequity through educational methods can be effective and help build household and community cohesion and adaptive capacity. -During recovery efforts from hurricanes, floods and other extreme climate events, expecting women to participate in rebuilding can be hard for them due to competing childcare and other household responsibilities, and communal living during the recovery period can create additional dangers for sexual and physical violence for women and girls' post-recovery. -In low-resource settings women have reduced agency to make healthcare decisions, the impacts of disease and disability are likely to be further magnified. - Some indigenous cultural beliefs affect women and girls, compelling them to eat less food as a form of intra-household adaptation to climate change. -Some disaster risk management programs exclude women from income-generating activities, or leadership roles in the program, and only consider their caregiving role. -Women often have less access to credit for climate change adaptation practices, including post-disaster relief, for example, to deal with salinization of water or flooding impacts -Some ecosystem-based adaptation initiatives do not take gender inequities into account and can reinforce gender and other social inequities in terms of discrimination. Development and climate programmes have to be redesigned to accommodate more context-specific policies instead of one-size-fits-all packages that will effectively address women's (and men's) differential needs and unequal relations and circumstances. Limited research and policy initiatives which consider climate change impacts on women's health and childcare and nutrition, particularly for vulnerable groups.

Table SMCCB GENDER.2: Gender integration in regional climate change policies.

Countries	**How is gender considered in climate policy?**	**Illustrative examples**	**Barriers to gender integration**
Central and South America			
Regional assessment of Central & South America	Gender-sensitive; gender-specific (varies by policy)	NDCs (Argentina, Brazil, Chile, Costa Rica, Paraguay and Uruguay) (Tramutola, 2019); National Plans and Programs of the IUCN (2012) for Costa Rica and Panamá; MIMP (2015) for Perú; and UICN (2014) for Cuba.	Insufficient commitment and capacities of actors involved; few relevant tools in both the design and implementation phases; scarce specialists, resources, disaggregated data, documented cases in the region added to the difficulty in generating

		International and Ibero-American Foundation of Administration and Public Policies (FIIAPP): Regional approach promoting learning and exchange of experiences between local actors and decision-makers in the 3 countries. Intersectoral coordination initiative Gender and Climate Change Action Plans (PAGcc), adopted in some Latin American and Caribbean countries (Casas Varez, 2017).	significant indicators (Tramutola, 2019). The vulnerability and resilience of women are dependent on household income diversification (Andersen et al., 2017) and household type.
Cuba. Guatemala Ecuador Perú, Costa Rica, Panamá Colombia	Gender-specific	(Cuba) Gender-based research in an integrated coastal zone management program (Montero et al., 2015).	(Cuba) Gender inequality in the integrated coastal zone management program.
		(Guatemala) Gender environmental policy is mainly linked to climate change adaptation (Bárcena Ibarra et al., 2020).	
		(Ecuador) *Sumak Kawsay* or Buen Vivir is a concept included in the Constitution of Ecuador in 2008 (Cáceres-Arteaga et al., 2020). Food Security and Gender Considerations (FORECCSA) policy uses a bottom-up approach, managed through community-based adaptation (Bárcena Ibarra et al., 2020).	(Ecuador) Indigenous women remain invisible in land tenure discussions (Radcliffe, 2014).
		(Perú, Cuba, Costa Rica, Panamá) Intersectoral coordination initiative Gender and Climate Change Action Plans (PAGcc).	
Colombia, Ecuador, Perú Chile	Gender-sensitive	(Colombia, Ecuador, Perú) International and Ibero-American Foundation of Administration and Public Policies (FIIAPP): Regional Approach promoting learning and exchange of experiences between local actors and decision-makers in the 3 countries.	(Columbia and Chile) Discrimination in land tenure for women (Tafur et al., 2015).
North America			
USA	Gender-specific	Declaration for Climate, Justice and Peace proposed by a movement Earth Democracy and a non-profit organisation Women's International League for Peace and Freedom (Price, 2014).	Differentiated economic interest conflict with addressing climate change and the gender gap (Tranter and Booth, 2015). Policies often have a homogenized cultural vision that erases Indigenous people's autonomy (Gay-Antaki, 2020) and fails to address the intersection of race, ethnicity, and gender for vulnerability to climate change (Vinyeta et al., 2016).

Canada, Mexico	Gender-sensitive	(Canada) New Feminist International Assistance Policy aims to incorporate the empowerment of women and girls, including policies addressing climate change (Sellers, 2018) Relevance of gendered climate adaptation emphasizing traditional food systems (Burch et al., 2014; Sellers, 2018; Williams, 2018) (Mexico) Mexican Nationally Determined Contribution (NDC) states gender equality and human rights as cross-cutting principles both for mitigation and adaptation. Legal reforms on water management (Silva Rodríguez de San Miguel, 2018).	(Canada) Research to support gender-sensitive policies (Natcher et al., 2020). Policies often have a homogenized cultural vision that erases Indigenous people's autonomy (Gay-Antaki, 2020). (Mexico) Discrimination in land tenure; gender division of labour; salary gap and barriers to job placement (Griffin Cohen, 2014), and the unequal distribution of benefits (Vázquez García, 2015).
Africa			
Africa regional assessment	Gender-neutral	A gender lens is rarely applied in national policies or programmes (e.g., Ethiopia's Climate Resilience Green Economy policy (Mersha and van Laerhoven, 2019), beyond the initial consultation stage (Holvoet and Inberg, 2014). Some gender and climate change action strategies and/or plans in several countries, including Liberia, Mozambique, Tanzania and Zambia (Ghana, 2012; Mozambique and IUCN, 2014; Zambia and IUCN, 2017)	Practical constraints such as lack of staff capacity on gender, and lack of funding to support gender integration in policy (Kristjanson et al., 2017); other forms of resistance which lead to inaction (Acosta et al., 2019); poor integration of women in decision-making processes. In African contexts, local institutions do not value fair access to production resources, such as land and financial capital, which increase the vulnerability of marginalized groups, including women and youth, under climate change conditions (Van Wijk et al., 2018; Edward, 2020) (see also Box 9.2 in Ch 9)
Europe			
European Union, Russian Federation. Norway, Sweden Russian Federation	Gender-sensitive	Gender equality is integrated into Constitutions, special laws on women's rights and the implementation of the Convention on the Elimination of All Forms of Discrimination against Women. There are no examples of direct gender mention from National adaptation plan). Sweden adopted the SDGs as local goals and the County's Comprehensive Plan is evaluated on these, e.g., considering gender in the use, access and safety of public spaces, and emphasizing development that facilitates climate-resilient lifestyles (Leander et al., 2021).	European climate change adaptation strategies and national policies are generally weak on gender, LGBTQI, and other social equity issues (Boeckmann and Zeeb, 2014; Allwood, 2020)
Turkey	Gender weak	Despite progress over the recent decade, gender differences are still a challenge, and are frequently wider among	Turkey Country Gender Assessment 2018 (Bank, 2018)

		vulnerable groups. Girls from lower-income backgrounds have significantly lower school enrollment rates than boys, while among the higher-income bracket gender parity has been achieved (Bank, 2018).	
Asia			
Malaysia	Gender-specific	Engagement of civil society, especially youth, in the development of the 2050 National Transformation Plan, a policy planning document outlining economic, social and environmental targets (Susskind et al., 2020) NGO advocacy for climate change actions studied impacts on sexual and reproductive health and rights among indigenous communities (Penita, 2015). The National Policy on Climate Change includes specific mention of women, children, youth, indigenous peoples, and their communities, as "Major Groups" and "Stakeholders" in addressing climate change, with a focus on effective participation (MNRE, 2010)	Despite national initiatives to increase women's participation in the workforce to provide them with social support (Lim, 2019) and to empower them (Baqutayan, 2020), gender mainstreaming, in general, is hampered by lack of full comprehension of gender issues (Ismail and Zakuan, 2014).
India Nepal	Gender-sensitive	Recognition of gendered vulnerability and need for targeting women in NAPCC (Roy et al., 2018). Gendered vulnerability is recognised across national and state climate action planning (Jafry, 2016; Singh et al., 2021). Skill enhancement programs in agriculture and fisheries to increase and diversify livelihood opportunities (Ministry of Agriculture, 2015; Stacey et al., 2019) The NAPA and the CCADRMA recognise the gender-differentiated impacts of climate change in agriculture (Paudyal et al., 2019; Khatri-Chhetri et al., 2020) Localised action for climate change adaptation and disaster risk reduction (Bhattarai et al., 2015; Ojha et al., 2016; Vij et al., 2019)	Underlying structural inequalities around workforce participation, inadequate diverse gender representation in decision-making bodies and processes. Women are less represented in local decision-making committees in almost all Asian countries. Organised community collectives such as women self-help groups have had a mixed experience in gaining rights and benefits for women with positive impacts such as improved incomes (Salas et al., 2017) and somewhat negative impacts on women's participation in local adaptation decisions (Singh, 2019). The continuing failure of development policy and practices to address structural inequalities such as land ownership and access to gender-sensitive agrobiodiversity management services and technologies and forests (Bhattarai et al., 2015; Khadka et al., 2015).
The small Island States			

Pacific Island Countries (eg: Fiji & Vanuatu)	Gender-specific / Gender-sensitive	Gender considerations are included in National Climate Change and Disaster Risk Reduction policies and frameworks (Community, 2015; Sawer et al., 2020) The inclusion of gender considerations strengthens national planning (Community, 2015; International Federation of Red Cross and Red Crescent, 2020). Pacific island countries are beginning to integrate gender into their climate change initiatives using a toolkit designed to support climate change practitioners in the region to integrate gender into their programmes and projects (South Pacific Regional Environment, 2014).	Barriers include financing to implement gender considerations in national policies (Mcleod et al., 2018; Kleiber et al., 2019).
Australasia			
Australia	Gender-neutral / Gender-specific	Across all levels of government, there is minimal consideration of gender in climate change policy that may increase vulnerability and social exclusion and affect adaptive capacity and resilience (Alston, 2017). Scant attention to gender in policies for emergency management and disaster response. National gender and emergency management guidelines were drafted in 2017 in Australia (Parkinson et al., 2017), but these have not been endorsed or adopted by any Australian government. The only literature located on climate and gender in Australia examined the different effects of drought on rural men and women (Pearce et al., 2018).	Lack of consideration of gender may be partially due to a lack of diverse gender representation in decision-making processes (Parkinson et al., 2017).
Aotearoa-New Zealand	Gender-sensitive	Recent Government-commissioned climate change risk assessments explicitly identify gender as one of the limiting factors for equitable resources in response to climate-related risks, including housing, employment, childcare, and safety (Environment, 2020) New Zealand-based Pacific Islander women have already demonstrated leadership roles in mobilising to respond to climate-related disasters and collaborations on their ancestral islands, demonstrating their abilities and networks of use in climate change adaptation and planning (Masaki, 2015).	No action is yet released by the Government that details how vulnerability will be reduced (Environment, 2020). A lack of gender-responsive design and implementation overlooks the growing evidence of the gendered experience of the impacts and projected risks of climate change and disasters, as well as the gendered nature of emergency management, in Australasia. This research identified gendered impacts on physical and mental health (Zara et al., 2016), as well as gender-based violence (Parkinson et al., 2017; Rees and Wells, 2020) and discrimination (Dominey-Howes et al., 2016; Gorman-Murray et al., 2017).

Table Notes:

Climate policies span from the gender-blind (implicitly men-biased, excluding women) to gender-transformative/ redistributive (interventions that intend to transform the existing distribution of resources and responsibilities to create more equitable gender relations). Along this continuum, policies can also take varied approaches such as gender-neutral (leave existing distribution of resources/ responsibility unchanged or unquestioned), gender-specific (targeting needs of women/men, but within existing distribution of resources/responsibilities), and gender-sensitive (focusing on identifying and reconfiguring processes which shape gender relations).

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Cross-Chapter Box FEASIB: Feasibility Assessment of Adaptation Options: An Update of the SR1.5 Supplementary Material

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SMCCB FEASIB.1 Feasibility Assessment of Adaptation Options as Presented in Section CCB FEASIB.2

SMCCB FEASIB.1.1 Feasibility Assessment of Adaptation Options in Energy System Transitions

Table SMCCB FEASIB.1: Feasibility assessment of energy system transition adaptation option: resilient power infrastructure, increased power reliability, and sustainable water management.

		Resilient Power Systems		**Energy reliability**		**Water use efficiency**	
	Evidence	High		Medium		Medium	
	Agreement	High		High		High	
Economic	Microeconomic viability	■	(O'Neill-Carrillo and Rivera-Quinones, 2018) ;(Hallegatte et al., 2019); (Mazur et al., 2019); (Marto et al., 2018); (Meltzer, 2018); (Mishra et al., 2020); (Meltzer, 2018) ; (Kwasinski et al., 2019); (Helgeson and O'Rear, 2018); (Mola et al., 2018); (Holt et al., 2021); (Stephenson et al., 2021); (Balezentis et al., 2021); (Jasiūnas et al., 2021); (Bennett et al., 2021); (Ratnam et al., 2020)	■	(Jasiūnas et al., 2021); (Arowolo et al., 2019); (Kim et al., 2019); (Azevedo de Almeida and Mostafavi, 2016); (Verschuuren, 2013); (Dawson et al., 2018);(Nik and Perera, 2020); (Espinoza et al., 2016); (Chester et al., 2020); (Lambert et al., 2011); (Panteli et al., 2017)	■	(Zhou et al., 2020); (Ceseña et al., 2019); (Zhang et al., 2018);(Wu et al., 2019); (Gjorgiev and Sansavini, 2018); (Padilha Campos Lopes et al., 2020); (Basheer and Ahmed Elagib, 2019); (Lim et al., 2018);(Basheer and Ahmed Elagib, 2019)
	Macroeconomic viability	■	(Hallegatte et al., 2019);(Marto et al., 2018); (Stephenson et	▨	(Jasiūnas et al., 2021);(Arowolo et al., 2019);(Panteli	■	(Zhou et al., 2020);(Ceseña et al., 2019)

		🟦	al., 2021);(Meltzer, 2018);(Bajwa et al., 2019);(Kwasinski et al., 2019);(Bennett et al., 2021);(Ratnam et al., 2020)	▨	and Mancarella, 2017);(Azevedo de Almeida and Mostafavi, 2016);(Kim et al., 2019);(Verschuuren, 2013) (Dawson et al., 2018);(Espinoza et al., 2016);(Chester et al., 2020);(Lambert et al., 2011);(Panteli et al., 2017)	🟦	(Zhang et al., 2018);(Gjorgiev and Sansavini, 2018);(Padilha Campos Lopes et al., 2020);(Basheer and Ahmed Elagib, 2019);(Lim et al., 2018)
	Socio-economic vulnerability reduction potential	🟦	(O'Neill-Carrillo and Rivera-Quinones, 2018);(Hallegatte et al., 2019);(Mazur et al., 2019);(Marto et al., 2018);(Meltzer, 2018);(Kwasinski et al., 2019);(Holt et al., 2021);(Jasiūnas et al., 2021):(Balezentis et al., 2021);(Schweikert and Deinert, 2021);(Bennett et al., 2021);(Ratnam et al., 2020)	🟦	(Jasiūnas et al., 2021);(Arowolo et al., 2019);(Panteli and Mancarella, 2017);(Kim et al., 2019);(Verschuuren, 2013);(Azevedo de Almeida and Mostafavi, 2016);(Dawson et al., 2018);(Espinoza et al., 2016);(Panteli et al., 2017)	🟦	(Zhou et al., 2020);(Zhang et al., 2018);(Wu et al., 2019);(Gjorgiev and Sansavini, 2018);(Padilha Campos Lopes et al., 2020);(Basheer and Ahmed Elagib, 2019);(Lim et al., 2018)
	Employment and productivity enhancement potential	▨	(Hallegatte et al., 2019);(Mazur et al., 2019);(Gebreslassie, 2020); (Balezentis et al., 2021);(Jasiūnas et al., 2021)	▨	(Arowolo et al., 2019);(Kim et al., 2019);(Azevedo de Almeida and Mostafavi, 2016);(Verschuuren, 2013);(Dawson et al., 2018);(Chester et al., 2020);(Lambert et al., 2011);(Panteli et al., 2017)	NE	
Technological	Technical resource availability	🟦	(O'Neill-Carrillo and Rivera-Quinones, 2018);(Hallegatte et al., 2019);(Mazur et al., 2019);(Bajwa et al., 2019) (O'Neill-Carrillo	🟦	(Bennett et al., 2021);(Jasiūnas et al., 2021);(Helmrich and Chester, 2020);(Bustamante et al., 2019);(Arowolo et al.,	🟦	(Zhou et al., 2020);(Ceseña et al., 2019);(Zhang et al., 2018);(Wu et al., 2019);(Gjorgiev and

			et al., 2019);(Holt et al., 2021);(Raoufi et al., 2020);(Schweikert and Deinert, 2021);(Bennett et al., 2021);(Ratnam et al., 2020)		2019);(Panteli and Mancarella, 2017);(Kim et al., 2019);(Azevedo de Almeida and Mostafavi, 2016);(Verschuuren, 2013);(Dawson et al., 2018);(Espinoza et al., 2016);(Chester et al., 2020);(Lambert et al., 2011);(Panteli et al., 2017)		Sansavini, 2018);(Padilha Campos Lopes et al., 2020);(Basheer and Ahmed Elagib, 2019);(Lim et al., 2018)
	Risks mitigation potential		(O'Neill-Carrillo and Rivera-Quinones, 2018);(Hallegatte et al., 2019);(Mazur et al., 2019);(Kwasinski et al., 2019);(O'Neill-Carrillo et al., 2019); (Raoufi et al., 2020);(Bajwa et al., 2019);(Schweikert and Deinert, 2021);(Bennett et al., 2021);(Ratnam et al., 2020)		(Bennett et al., 2021);(Jasiūnas et al., 2021);(Helmrich and Chester, 2020);(Bustamante et al., 2019);(Arowolo et al., 2019);(Panteli and Mancarella, 2017);(Kim et al., 2019);(Azevedo de Almeida and Mostafavi, 2016);(Verschuuren, 2013);(Dawson et al., 2018);(Espinoza et al., 2016);(Chester et al., 2020);(Lambert et al., 2011);(Panteli et al., 2017)		(Zhou et al., 2020);(Ceseña et al., 2019);(Zhang et al., 2018);(Wu et al., 2019);(Gjorgiev and Sansavini, 2018);(Padilha Campos Lopes et al., 2020);(Basheer and Ahmed Elagib, 2019);(Lim et al., 2018)
Institutional	Political acceptability		(Hallegatte et al., 2019);(Marto et al., 2018);(Mola et al., 2018);(Farahmand et al., 2020);(Stephenson et al., 2021); (Osabuohien et al., 2021);(Oviedo-Toral et al., 2021)		(Arowolo et al., 2019);(Azevedo de Almeida and Mostafavi, 2016);(Verschuuren, 2013);(Dawson et al., 2018);(Nik and Perera, 2020);(Lambert et al., 2011);(Panteli et al., 2017)		(Zhang et al., 2018);(Gjorgiev and Sansavini, 2018);(Basheer and Ahmed Elagib, 2019);(Lim et al., 2018)
	Legal and regulatory acceptability		(Marto et al., 2018);(Helgeson and O'Rear, 2018);(Osabuohie		(Arowolo et al., 2019);(Verschuuren, 2013);(Azevedo	LE	(Gjorgiev and Sansavini, 2018)

		🟦	n et al., 2021);(Farahmand et al., 2020);(Stephenson et al., 2021);(Oviedo-Toral et al., 2021);(Oviedo-Toral et al., 2021)	🟦	de Almeida and Mostafavi, 2016);(Verschuuren, 2013);(Dawson et al., 2018);(Lambert et al., 2011)		
	Institutional capacity and administrative feasibility	🟦	(Marto et al., 2018);(Farahmand et al., 2020);(Osabuohien et al., 2021);(Oviedo-Toral et al., 2021)	🟦	(Arowolo et al., 2019);(Kim et al., 2019);(Azevedo de Almeida and Mostafavi, 2016);(Verschuuren, 2013);(Dawson et al., 2018);	🟦	(Gjorgiev and Sansavini, 2018);(Basheer and Ahmed Elagib, 2019)
	Transparency and accountability potential	🟦	(Marto et al., 2018);(Farahmand et al., 2020);(Osabuohien et al., 2021);(Holt et al., 2021);(Stephenson et al., 2021)	NE		NE	
Socio-cultural	Social co-benefits (health, education)	■	(Mazur et al., 2019);(Helgeson and O'Rear, 2018);(Vuichard et al., 2021);(Aklin et al., 2018);(Balezentis et al., 2021);(Johnson et al., 2020);(Oviedo-Toral et al., 2021)	■	(Jasiūnas et al., 2021);(Arowolo et al., 2019);(Kim et al., 2019);(Azevedo de Almeida and Mostafavi, 2016);(Verschuuren, 2013);(Dawson et al., 2018);(Nik and Perera, 2020);(Espinoza et al., 2016);(Chester et al., 2020);(Lambert et al., 2011)	LE	(Zhang et al., 2018);(Basheer and Ahmed Elagib, 2019)
	Socio-cultural acceptability	■	(Hallegatte et al., 2019);(Mazur et al., 2019);(Vuichard et al., 2021);(Aklin et al., 2018);(Balezentis et al., 2021);(Jasiūnas et al., 2021);(Johnson et al., 2020);(Oviedo-Toral et al., 2021)	■	(Jasiūnas et al., 2021);(Arowolo et al., 2019);(Kim et al., 2019);(Verschuuren, 2013);(Dawson et al., 2018);(Nik and Perera, 2020);(Espinoza et al., 2016);(Chester et al., 2020);{Lambert, 2011 #30	LE	{Basheer, 2019 #45

	Social and regional inclusiveness	🟦	(Hallegatte et al., 2019);(Mazur et al., 2019);(Vuichard et al., 2021);(Aklin et al., 2018):(Balezentis et al., 2021);(Johnson et al., 2020);(Jasiūnas et al., 2021);(Oviedo-Toral et al., 2021)	🟦	(Jasiūnas et al., 2021);(Verschuuren, 2013);(Dawson et al., 2018);(Nik and Perera, 2020)	NE	
	Gender equity	▨	(Hallegatte et al., 2019);(Mazur et al., 2019) (Aklin et al., 2018);(Johnson et al., 2020);(Oviedo-Toral et al., 2021)	LE	(Jasiūnas et al., 2021)	NE	
	Intergenerational equity	▨	(Mazur et al., 2019);(Aklin et al., 2018);(Johnson et al., 2020);(Oviedo-Toral et al., 2021)	LE	(Jasiūnas et al., 2021)	NE	
Environmental/ecological	Ecological capacity	▨	(Mazur et al., 2019);(Osabuohien et al., 2021)	NE		🟦	(Zhou et al., 2020);(Ceseña et al., 2019);(Zhang et al., 2018);(Wu et al., 2019);(Gjorgiev and Sansavini, 2018);(Padilha Campos Lopes et al., 2020);(Basheer and Ahmed Elagib, 2019);(Lim et al., 2018)
	Adaptive capacity/ resilience	🟦	(Hallegatte et al., 2019);(Mazur et al., 2019) (Mishra et al., 2020);(Holt et al., 2021);(Oviedo-Toral et al., 2021);(Schweikert and Deinert, 2021)	🟦	(Bennett et al., 2021);(Verschuuren, 2013);(Dawson et al., 2018);(Espinoza et al., 2016);(Lambert et al., 2011)	🟦	(Zhou et al., 2020);(Ceseña et al., 2019);(Zhang et al., 2018);(Wu et al., 2019);(Gjorgiev and Sansavini, 2018);(Padilha Campos Lopes et al.,

		■		■		■	2020);(Basheer and Ahmed Elagib, 2019);(Lim et al., 2018; Basheer and Ahmed Elagib, 2019)
Geophysical	Physical feasibility	NA		NA		▨	(Zhou et al., 2020);(Ceseña et al., 2019);(Zhang et al., 2018);(Wu et al., 2019);(Gjorgiev and Sansavini, 2018);(Padilha Campos Lopes et al., 2020);(Basheer and Ahmed Elagib, 2019);(Lim et al., 2018)
	Land use change enhancement potential	NA		NA		■	Zhou, 2020 #48};(Ceseña et al., 2019);(Zhang et al., 2018);(Wu et al., 2019);(Gjorgiev and Sansavini, 2018);(Padilha Campos Lopes et al., 2020);(Basheer and Ahmed Elagib, 2019);(Lim et al., 2018)
	Hazard risk reduction potential	■	(Mazur et al., 2019);(Marto et al., 2018);(Mishra et al., 2020);(Bajwa et al., 2019);(Holt et al., 2021)	NA		■	(Zhou et al., 2020);(Ceseña et al., 2019);(Zhang et al., 2018);(Wu et al., 2019);(Gjorgiev and Sansavini, 2018);(Padilha Campos Lopes et al., 2020);(Basheer and Ahmed Elagib, 2019);(Lim et al., 2018)

SMCCB FEASIB.1.2 Feasibility Assessment of Adaptation Options in Land and Ecosystem Transition

Table SMCCB FEASIB.2 Feasibility assessment of land and ecosystem transition adaptation options: integrated coastal zone management (including integrated soil management, conservation agriculture), sustainable aquaculture, and coastal defense and hardening.

		Integrated coastal zone management (including integrated soil management, conservation agriculture)		**Sustainable aquaculture**		**Coastal defense and hardening**	
	Evidence	Robust		Medium		Robust	
	Agreement	High		Medium		Medium	
Economic	Microeconomic viability	▓	(Runting et al., 2017);(Jones et al., 2020);(Romañach et al., 2018);(Perera-Valderrama et al., 2020)	■	(Boonstra and Hanh, 2015);(Joffre et al., 2015);(FAO, 2016);(FAO, 2018);(Pérez-Escamilla, 2017);(Galappaththi et al., 2020);(Blasiak and Wabnitz, 2018);(Shaffril et al., 2017);(Chan et al., 2019);(Massa et al., 2020);(Mustafa et al., 2021);(Thomas et al., 2021);(Xuan and Sandorf, 2020);(Xuan and Sandorf, 2020);(Ahmed et al., 2018);(Ahmed and Turchini, 2021);(Oyebola et al., 2021)	▓	(Firth et al., 2014);(Barbier, 2015a);(Elliott and Wolanski, 2015);(Diaz, 2016; Cardona et al., 2020);(Betzold and Mohamed, 2017);(Siders and Keenan, 2020);(Antunes do Carmo, 2018); ;(Waryszak et al., 2021);(Waryszak et al., 2021);(Lima and Coelho, 2021)
	Macroeconomic viability	░	(Antunes do Carmo, 2018);(Erftemeijer et al., 2020);(Hanley et al., 2020);(Morris et al., 2019);(Propato et al., 2018);(Runting et al., 2017);(Villamizar et al., 2017);(Baills et	■	(UNEP, 2013);(Edwards, 2015); (Moffat, 2017);(Mustafa et al., 2021);(Osmundsen et al., 2020);(Thomas et al., 2021);(Ahmed et al., 2018);(Boyd et al., 2020)	░	(Hinkel et al., 2014);(Estrada et al., 2017);(Antunes do Carmo, 2018);(Magnan and Duvat, 2018);(Morris et al., 2019);(Morris et al., 2018);(Baills et al., 2020);(Vousdoukas et al.,

			al., 2020);(Magnan and Duvat, 2018);(Rosendo et al., 2018);(O'Mahony et al., 2020);(Morecroft et al., 2019);(Jones et al., 2020);(Donatti et al., 2020);(Hassanali, 2017);(Lamari et al., 2016);(Barragán Muñoz, 2020); (Caviedes et al., 2020);(Botero and Zielinski, 2020);(Martuti et al., 2020);(Lin et al., 2021);(Mestanza-Ramón et al., 2019)				2016);(Kuhl et al., 2020)
	Socio-economic vulnerability reduction potential		(Morecroft et al., 2019);(Donatti et al., 2020);(Pérez-Cayeiro and Chica-Ruiz, 2015);(Phillips et al., 2018)		(Smith et al., 2015);(Orchard et al., 2015);(Béné et al., 2016);(Jennings et al., 2016);(Mycoo, 2017);(Ahmed et al., 2018) (Stentiford et al., 2020);(Xuan and Sandorf, 2020);(Custódio et al., 2020);(Thomas et al., 2021)		(Rabbani et al., 2010a; Rabbani et al., 2010b);(Gutiérrez et al., 2012);(Arkema et al., 2013);(Arkema et al., 2017); (Neumann et al., 2015);(Sovacool et al., 2015); (Sutton-Grier et al., 2015);(Betzold and Mohamed, 2017); (Antunes do Carmo, 2018);(Siders and Keenan, 2020) (Kind et al., 2017)
	Employment and productivity enhancement potential	LE	(Morris et al., 2019);(Jones et al., 2020)		(Sánchez et al., 2002);(De Silva and Davy, 2010);(Ahmed et al., 2014);(Boonstra and Hanh, 2015);(Lacoue-Labarthe et al., 2016);(Asiedu et al., 2017);(Blasiak and Wabnitz,	NE	

				🟦	2018);(Mustafa et al., 2021);(Osmundsen et al., 2020);(Stentiford et al., 2020);(Qurani et al., 2021);(Hargan et al., 2020);(Jayanthi et al., 2018);(FAO, 2018)		
Technological	Technical resource availability	L E	(Baills et al., 2020);(Hassanali, 2017)	▨	(UNEP, 2013);(Ahmed et al., 2014);(Brillant, 2014);(Edwards, 2015);(Lucas, 2015);(Fidelman et al., 2017);(Aubin et al., 2019);(Shaffril et al., 2017);(Galappaththi et al., 2019);(Shaffril et al., 2017);(Heasman et al., 2020);(Mustafa et al., 2021);(Mustapha et al., 2021);(Osmundsen et al., 2020);(Sampantamit et al., 2020);(Thomas et al., 2021);(Xuan and Sandorf, 2020);(Xuan et al., 2021);(Ahmed et al., 2018);(Boyd et al., 2020);(Bohnes et al., 2019);(Ahmed and Turchini, 2021);(Oyebola et al., 2021)	🟦	(Arkema et al., 2013);(Bosello and De Cian, 2014);(Smajgl et al., 2015);(Hauer et al., 2016);(Betzold and Mohamed, 2017);(Williams et al., 2018);(Antunes do Carmo, 2018);(Baills et al., 2020);(Alves et al., 2020)
	Risks mitigation potential	▨	(Baills et al., 2020);(Morecroft et al., 2019);(Gómez Martín et al., 2020); (Hamin et al., 2018)	🟦	(Boonstra and Hanh, 2015);(Blanchard et al., 2017) (Blasiak and Wabnitz, 2018);(Boyd et al., 2020);(Xuan	🟦	(Firth et al., 2014);(Sovacool et al., 2015);(André et al., 2016);(Cashman and Nagdee, 2017);(Brown et al.,

					and Sandorf, 2020);(Xuan et al., 2021);(Mustafa et al., 2021);(Bricknell et al., 2021) (Bohnes et al., 2019)		2018);(Storlazzi et al., 2018);(Williams et al., 2018);(Antunes do Carmo, 2018) (Baills et al., 2020);(Hamin et al., 2018);(Morris et al., 2019)
Institutional	Political acceptability		(Le Cornu et al., 2018);(Alves et al., 2020);(Antunes do Carmo, 2018);(Villamizar et al., 2017);(Magnan and Duvat, 2018);(Rosendo et al., 2018);(Warnken and Mosadeghi, 2018);(Pérez-Cayeiro and Chica-Ruiz, 2015);(Mestanza-Ramón et al., 2019);(Barragán Muñoz, 2020)		(Brander, 2007);(Bell et al., 2011);(Bell and Taylor, 2015);(FAO, 2016) ;(Weatherdon et al., 2016);(Asiedu et al., 2017) (Ertör and Ortega-Cerdà, 2017);(Shaffril et al., 2017);(Sønvisen and Vik, 2021)		(Duvat, 2013);(Nordstrom, 2014); (Sovacool et al., 2015);(Betzold and Mohamed, 2017); (Antunes do Carmo, 2018);(Ratter et al., 2019) (O'Donnell, 2019);(Kuhl et al., 2020)
	Legal and regulatory acceptability		(Le Cornu et al., 2018);(Antunes do Carmo, 2018);(Morris et al., 2019);(Propato et al., 2018);(Runting et al., 2017);(Villamizar et al., 2017);(Magnan and Duvat, 2018);(Rosendo et al., 2018);(O'Mahony et al., 2020);(Morecroft et al., 2019);(Warnken and Mosadeghi, 2018);(Lamari et al., 2016);(Pérez-Cayeiro and Chica-Ruiz, 2015);(Phillips et al., 2018);(Barragán Muñoz, 2020); (Perera-Valderrama et		(Broitman et al., 2017); (Aubin et al., 2019) (Fidelman et al., 2017);(Cavallo et al., 2021) (Heasman et al., 2020);(Osmundsen et al., 2020);(Xuan et al., 2021);(Aubin et al., 2019)	L E	(Foti et al., 2020);(O'Donnell, 2019)

			al., 2020);(Telave and Chandankar, 2021);(Ellison et al., 2020)				
	Institutional capacity and administrative feasibility		(Le Cornu et al., 2018);(Alves et al., 2020);(Antunes do Carmo, 2018):(Propato et al., 2018);(Magnan and Duvat, 2018);(Rosendo et al., 2018);(O'Mahony et al., 2020);(Morecroft et al., 2019);(Warnken and Mosadeghi, 2018);(Donatti et al., 2020);(Hassanali, 2017);(Lamari et al., 2016);(Walsh, 2019);(Pérez-Cayeiro and Chica-Ruiz, 2015);(Phillips et al., 2018);(Mathew et al., 2020);(Romañach et al., 2018);(Barragán Muñoz, 2020);(Caviedes et al., 2020);(Perera-Valderrama et al., 2020);(Botero and Zielinski, 2020);(Mestanza-Ramón et al., 2019)		(Ahmed et al., 2014); (Broitman et al., 2017); (Fidelman et al., 2017);(Galappaththi et al., 2019);(Shaffril et al., 2017);(Le Cornu et al., 2018) (Blasiak and Wabnitz, 2018);(Massa et al., 2020);(Sampantamit et al., 2020);(Ahmed et al., 2018)		(Hallegatte et al., 2013);(Spalding et al., 2014); (Mills et al., 2016);(Estrada et al., 2017); (Antunes do Carmo, 2018);(Hamin et al., 2018)
	Transparency and accountability potential		(O'Mahony et al., 2020);(Hamin et al., 2018);(Lamari et al., 2016)		(Blasiak and Wabnitz, 2018);(Cavallo et al., 2021);(Osmundsen et al., 2020);(Stentiford et al., 2020);(Xuan et al., 2021)	L E	(Hamin et al., 2018)
Socio-cultural	Social co-benefits		(Hanley et al., 2020);(Morris		(Weatherdon et al.,		(Sovacool et al., 2015);(Sutton-

	(health, education)		et al., 2019);(Propato et al., 2018);(Baills et al., 2020);(O'Mahony et al., 2020);(Morecroft et al., 2019);(Jones et al., 2020);(Donatti et al., 2020);(Gómez Martín et al., 2020);(Hamin et al., 2018);(Erftemeijer et al., 2020);(Romañach et al., 2018);(Perera-Valderrama et al., 2020);(Martuti et al., 2020);(Telave and Chandankar, 2021);(Ellison et al., 2020);(Mestanza-Ramón et al., 2019)		2016);(Fidelman et al., 2017);(Aubin et al., 2019);(Shaffril et al., 2017) (Blasiak and Wabnitz, 2018);(Custódio et al., 2020);(Mustafa et al., 2021) ;(Osmundsen et al., 2020);(Stentiford et al., 2020);(Thomas et al., 2021);(Xuan and Sandorf, 2020);(Xuan et al., 2021);(Ahmed et al., 2018) (Qurani et al., 2021);(Freduah et al., 2018)		Grier et al., 2015);(Arkema et al., 2017);(Betzold and Mohamed, 2017); (Baills et al., 2020);(Hamin et al., 2018)
	Socio-cultural acceptability		(Antunes do Carmo, 2018);(Magnan and Duvat, 2018);(O'Mahony et al., 2020);(Warnken and Mosadeghi, 2018);(Lamari et al., 2016);(Walsh, 2019);(Morris et al., 2019);(Barragán Muñoz, 2020);(Caviedes et al., 2020)		(Asiedu et al., 2017);(Fidelman et al., 2017);(Galappaththi et al., 2019);(Blasiak and Wabnitz, 2018) (Thomas et al., 2021);(Cavallo et al., 2021) (Heasman et al., 2020);(Kluger and Filgueira, 2021) (Krause et al., 2020);(Mustafa et al., 2021) (Xuan et al., 2021)		(Sovacool et al., 2015);(Gibbs, 2016); (Morris et al., 2016);(Betzold and Mohamed, 2017); (Marengo et al., 2017);(Siriwardane-de Zoysa, 2020)
	Social and regional inclusiveness		(Alves et al., 2020);(Antunes do Carmo, 2018);(Rosendo et al., 2018);(O'Mahony et al., 2020);(Morecroft et al., 2019);(Lamari		(Galappaththi et al., 2020);(Mustafa et al., 2021);(Thomas et al., 2021);(Ahmed and Turchini, 2021);(Cavallo et al., 2021)		(Antunes do Carmo, 2018);(Alves et al., 2020);(Hamin et al., 2018);(Siriwardane-de Zoysa, 2020)

			et al., 2016);(Hamin et al., 2018);(Romañach et al., 2018);(Barragán Muñoz, 2020);(Caviedes et al., 2020);(Perera-Valderrama et al., 2020);(Martuti et al., 2020);(Mestanza-Ramón et al., 2019);(Ellison et al., 2020)		(Kluger and Filgueira, 2021);(Massa et al., 2020);(Bricknell et al., 2021);(Galappaththi et al., 2020);(Oyebola et al., 2021)		
	Gender equity		(Hamin et al., 2018); (Barreto et al., 2020);(Nguyen Mai and Dang Hoang, 2018);(de la Torre-Castro, 2019);(Hoegh-Guldberg and al., 2019);(Sen, 2021) (Pearson et al., 2019; Milanés Batista et al., 2020)		(Galappaththi et al., 2019);(Stentiford et al., 2020);(Leakhena et al., 2018);(Alleway et al., 2018);(Valenti et al., 2018);(Gopal et al., 2020)	LE	(Hamin et al., 2018)
	Intergenerational equity		(Baills et al., 2020);(Hamin et al., 2018) (Perera-Valderrama et al., 2020)	NE		LE	(Baills et al., 2020);(Hamin et al., 2018)
Environmental/ecological	Ecological capacity		(Le Cornu et al., 2018);(Antunes do Carmo, 2018);(Erftemeijer et al., 2020);(Krauss and Osland, 2020);(Morris et al., 2019);(Propato et al., 2018);(O'Mahony et al., 2020);(Morecroft et al., 2019);(Warnken and Mosadeghi, 2018);(Jones et al., 2020);(Donatti et al., 2020);(Gómez		(David et al., 2015); (Joffre et al., 2015);(Blanchard et al., 2017);(Broitman et al., 2017);{Ahmed, 2018 #90};(Aubin et al., 2019);(Custódio et al., 2020);(Mustafa et al., 2021);(Osmundsen et al., 2020);(Qurani et al., 2021);(Stentiford et al., 2020);(Thomas		(Bilkovic and Mitchell, 2013);(Spalding et al., 2014); (Joffre et al., 2015);(Sutton-Grier et al., 2015); (Foti et al., 2020);(Morris et al., 2018);(Morris et al., 2019);(Hall et al., 2018); (Hamin et al., 2018);(Hanley et al., 2020);(Winters et al., 2020);(Tanaya et al., 2021);(Scheres

			Martín et al., 2020);(Hamin et al., 2018);(Hanley et al., 2020);(Cantasano et al., 2021); (Romañach et al., 2018); (Perera-Valderrama et al., 2020)		et al., 2021);(Ahmed et al., 2018);(Boyd et al., 2020);(Sampantamit et al., 2020);(Bohnes et al., 2019; Ahmed and Turchini, 2021)		and Schüttrumpf, 2019) (Loon-Steensma and Vellinga, 2019);(Schoonees et al., 2019);(Waryszak et al., 2021) (Ghiasian et al., 2021; Joy and Gopinath, 2021);(Stender et al., 2021)
	Adaptive capacity/ resilience		(Le Cornu et al., 2018);(Alves et al., 2020) (Erftemeijer et al., 2020);(Hanley et al., 2020);(Krauss and Osland, 2020);(Propato et al., 2018; Morris et al., 2019);(Villamizar et al., 2017);(Rosendo et al., 2018);(O'Mahony et al., 2020);(Morecroft et al., 2019);(Jones et al., 2020);(Gómez Martín et al., 2020);(Hamin et al., 2018);(Foti et al., 2020)		(Boonstra and Hanh, 2015);(Orchard et al., 2015); (Blanchard et al., 2017);(Cinner et al., 2018 {Shaffril, 2017 #17); (Galappaththi et al., 2020);(Galappaththi et al., 2019);(Bricknell et al., 2021);(Freduah et al., 2018);(Qurani et al., 2021);(Stentiford et al., 2020);(Thomas et al., 2021);(Ahmed et al., 2018)		(Spalding et al., 2014);(Orchard et al., 2015); (Fidelman et al., 2017);(Morris et al., 2019); (Siders and Keenan, 2020);(Antunes do Carmo, 2018);(Hamin et al., 2018);(Hanley et al., 2020) (Magnan and Duvat, 2018);(Mills et al., 2016)
Geophysical	Physical feasibility		(Erftemeijer et al., 2020); (Morris et al., 2019);(Propato et al., 2018);(Runting et al., 2017);(Lamari et al., 2016);(Magnan and Duvat, 2018);(Cantasano et al., 2021);(Mathew et al., 2020)		(David et al., 2015);(Adhikari et al., 2018); (Ahmed et al., 2018);(Galappaththi et al., 2019);(Bricknell et al., 2021);(FAO, 2018)		(Duvat, 2013);(Hinkel et al., 2014);(Smith et al., 2015);(André et al., 2016) (Cooper et al., 2016);(Vousdoukas et al., 2016);(Arkema et al., 2017);(Antunes do Carmo, 2018);(Foti et al., 2020);(Morris et al., 2019) (Lima and Coelho, 2021)
	Land use change		(Erftemeijer et al.,		(Mialhe et al., 2016);(Mustafa	LE	(Sutton-Grier et al.,

	enhancement potential	■	2020);(Hanley et al., 2020);(Krauss and Osland, 2020);(Morris et al., 2019);(Propato et al., 2018);(Baills et al., 2020);(Morecroft et al., 2019);(Jones et al., 2020);(Donatti et al., 2020);(Gómez Martín et al., 2020);(Hamin et al., 2018);(Romañach et al., 2018);(Ellison et al., 2020);(Cantasano et al., 2021)	▨	et al., 2021) (Stentiford et al., 2020);(Turolla et al., 2020) (Ahmed et al., 2018);(Bricknell et al., 2021) (Ahmed and Turchini, 2021)		2015);(Hamin et al., 2018)
	Hazard risk reduction potential	■	(Hanley et al., 2020);(Krauss and Osland, 2020);(Marijnissen et al., 2020);(Morris et al., 2019);(Baills et al., 2020);(Morecroft et al., 2019);(Jones et al., 2020);(Donatti et al., 2020);(Gómez Martín et al., 2020);(Phillips et al., 2018);(Romañach et al., 2018);(Martuti et al., 2020);(Ellison et al., 2020);(Cantasano et al., 2021)	■	(Joffre et al., 2015); (Blanchard et al., 2017); (Daly et al., 2017);(Hung et al., 2018);(Galappaththi et al., 2019);(Galappaththi et al., 2019);(Mustafa et al., 2021);(Stentiford et al., 2020);(Ahmed et al., 2018)	▨	(Luisetti et al., 2013);(Firth et al., 2014); (Spalding et al., 2014); (Barbier, 2015b);(Sutton-Grier et al., 2015); (André et al., 2016);(Narayan et al., 2016);(Arkema et al., 2017);(Fu and Song, 2017);(Alves et al., 2020);(Antunes do Carmo, 2018);(Siders and Keenan, 2020);(Baills et al., 2020) (Magnan and Duvat, 2018; Tiggeloven et al., 2020);(Lincke and Hinkel, 2018);(Lima and Coelho, 2021)

Table SMCCB FEASIB.3: Feasibility assessment of land and ecosystem transition adaptation options: sustainable forest management and conservation, reforestation and afforestation, biodiversity management and ecosystem connectivity, and agroforestry.

		Sustainable forest management and conservation, reforestation and afforestation		**Biodiversity management and ecosystem connectivity**		**Agroforestry**	
	Evidence	High		Medium		Medium	
	Agreement	Medium		Medium		High	
Economic	Microeconomic viability		(Bustamante et al., 2019); (Chow et al., 2019); (Lochhead et al., 2019);(Seddon et al., 2019) (Seddon et al., 2020b);(Seddon et al., 2020a);(Ambrosino et al., 2020);(Nunes et al., 2020);(Ota et al., 2020)		(Lausche et al., 2013); (Chausson et al., 2020); (Gray et al., 2020); (Jones et al., 2020)		(Valdivia et al., 2012);(Murthy, 2013);(Lasco et al., 2014); (Mbow et al., 2014b);(Mbow et al., 2014a);(Brockington et al., 2016);(Iiyama et al., 2017);(Jacobi et al., 2017);(Hernández-Morcillo et al., 2018);(Quandt, 2020);(Castle et al., 2021) (Miller et al., 2020);(Jordon et al., 2020);(Williams et al., 2021);(Sharma et al., 2020);(Cechin et al., 2021);(Dhyani et al., 2021)
	Macroeconomic viability		(Bustamante et al., 2019);(Lochhead et al., 2019);(Chausson et al., 2020); (Seddon et al., 2020b)	L E	(Chausson et al., 2020); (Seddon et al., 2020a)		(Valdivia et al., 2012);(Lasco et al., 2014);(Jacobi et al., 2017);(Hernández-Morcillo et al., 2018; Williams et al., 2021); (Sharma et al., 2020); (Ogada et al., 2020);(Dhyani et al., 2021); (Cechin et al., 2021);(Smith et al., 2021)
	Socio-economic vulnerability reduction potential		(Bustamante et al., 2019); (Ambrosino et al., 2020); (Fleischman et al., 2020);(Nunes et al., 2020);(Ota et al., 2020) (Seddon et al., 2020b);(Seddon et al., 2020a) (Woroniecki et al., 2019)		(Ambrosino et al., 2020); (Chausson et al., 2020); (Seddon et al., 2020a)		(Valdivia et al., 2012);(Brockington et al., 2016); (Coq-Huelva et al., 2017); (Coulibaly et al., 2017); (Iiyama et al., 2017);(Jacobi et al., 2017);(Quandt, 2020);(Castle et al., 2021); (Williams et al., 2021); (Sharma et

							al., 2020);(Ogada et al., 2020);(Cechin et al., 2021);(Elagib and Al-Saidi, 2020)
	Employment and productivity enhancement potential		(Bustamante et al., 2019);(Rahman et al., 2019);(Ambrosino et al., 2020);(Chausson et al., 2020); (Nunes et al., 2020); (Ota et al., 2020);(Seddon et al., 2020b)		(Ambrosino et al., 2020);(Chausson et al., 2020);(Seddon et al., 2020a)		(Verchot et al., 2007);(Buckeridge et al., 2012);(Jain and Mehta, 2020);(Williams et al., 2021);(Sharma et al., 2020);(Ogada et al., 2020);(Elagib and Al-Saidi, 2020)
Technological	Technical resource availability		(Bustamante et al., 2019);(Ambrosino et al., 2020);(Nunes et al., 2020)	NE	No evidence found		(Verchot et al., 2007);(Valdivia et al., 2012);(Mbow et al., 2014b);(Iiyama et al., 2017);(Jacobi et al., 2017);(Hernández-Morcillo et al., 2018);(Elagib and Al-Saidi, 2020)
	Risks mitigation potential		(Bustamante et al., 2019);(Lange et al., 2019);(Moomaw et al., 2019);(Morecroft et al., 2019);(Seddon et al., 2020a; Seddon et al., 2020b);(Sinay and Carter, 2020)		(Lausche et al., 2013);(Lange et al., 2019);(Chausson et al., 2020);(Donatti et al., 2020)		(Verchot et al., 2007);(Jacobi et al., 2017);(Abdulai et al., 2018);(Hernández-Morcillo et al., 2018);(Sida et al., 2018)
Institutional	Political acceptability		(Lange et al., 2019);(Chausson et al., 2020);(Seddon et al., 2020b)		(Lausche et al., 2013);(Lange et al., 2019);(Schmitz et al., 2015);(Chausson et al., 2020);(Seddon et al., 2020a)		(Buckeridge et al., 2012);(Mbow et al., 2014a);(Jacobi et al., 2017);(De Zoysa and Inoue, 2014);(Coe et al., 2014);(Williams et al., 2021);(Cechin et al., 2021);(Dhyani et al., 2021)
	Legal and regulatory acceptability		(Bustamante et al., 2019);(Lange et al., 2019)		(Lausche et al., 2013);(Schmitz et al., 2015);(D'Aloia et al., 2019);(Gray et al., 2020)		(Place et al., 2012);(Mbow et al., 2014b),(Mbow et al., 2014a);(Jacobi et al., 2017);(Hernández-Morcillo et al., 2018) (De Zoysa

							and Inoue, 2014);(Coe et al., 2014);(Martin et al., 2020); (Dhyani et al., 2021)
	Institutional capacity and administrative feasibility		(Bustamante et al., 2019); (Chow et al., 2019); (Nunes et al., 2020); (Seddon et al., 2020a); (Woroniecki et al., 2019)		(Lausche et al., 2013); (Seddon et al., 2020a); (Keeley et al., 2018b)		(Buckeridge et al., 2012);(Place et al., 2012);(Jacobi et al., 2017);(Hernández-Morcillo et al., 2018);(De Zoysa and Inoue, 2014);(Coe et al., 2014);(Martin et al., 2020);(Dhyani et al., 2021)
	Transparency and accountability potential	NE	No evidence found	NE	No evidence found		(Nair, 2012);(Coe et al., 2014)
Socio-cultural	Social co-benefits (health, education)		(Moomaw et al., 2019); (Morecroft et al., 2019); (Muricho et al., 2019);(Rahman et al., 2019);(Bhattarai, 2020); (Chausson et al., 2020);(Ota et al., 2020); (Seddon et al., 2020a); (Sinay and Carter, 2020);(von Holle et al., 2020)		(Lausche et al., 2013); (Worboys et al., 2016); (Donatti et al., 2020); (Chausson et al., 2020); (Lavorel et al., 2020); (Seddon et al., 2020a); (Van Langevelde et al., 2020); (White and Razgour, 2020);(Gibb et al., 2020);(Schmeller et al., 2020)		(Brockington et al., 2016);(Varela-Ortega et al., 2016);(Clark and Tilman, 2017);(Coq-Huelva et al., 2017);(Coulibaly et al., 2017);; (Jacobi et al., 2017);(Quandt et al., 2017);(Thierfelder et al., 2017);(Hernández-Morcillo et al., 2018);(Meijer et al., 2015); (Dhyani et al., 2021);(Castle et al., 2021);(Williams et al., 2021);(Ogada et al., 2020);(Cechin et al., 2021);(Elagib and Al-Saidi, 2020)
	Socio-cultural acceptability		(Lange et al., 2019);(Ambrosino et al., 2020)		(Lausche et al., 2013); (Seddon et al., 2020a); (Jones et al., 2020)		(Jarvis et al., 2008);(Valdivia et al., 2012);(Coq-Huelva et al., 2017);(Iiyama et al., 2017);(Jacobi et al., 2017);(Hernández-Morcillo et al., 2018);(Cedamon et al., 2018);(Quandt et al., 2017);(Ghosh-

							Jerath et al., 2021);(Santoro et al., 2020);(Williams et al., 2021)
	Social and regional inclusiveness		(Bustamante et al., 2019); (Muricho et al., 2019);(Weng et al., 2019); (Ambrosino et al., 2020); (Ota et al., 2020);(Seddon et al., 2020a)	LE	(Worboys et al., 2016); (Chausson et al., 2020)		(Valdivia et al., 2012);(Iiyama et al., 2017);(Jacobi et al., 2017); (Cedamon et al., 2018);(Castle et al., 2021)
	Gender equity		(Ambrosino et al., 2020); (Bhattarai, 2020); (Ota et al., 2020); (Seddon et al., 2020a);(Woroniecki et al., 2019)	LE	(Worboys et al., 2016)	NA	
	Intergenerational equity		(Ambrosino et al., 2020); (Ota et al., 2020)	NE	No evidence found	NE	No evidence found
Environmental/ecological	Ecological capacity		(Bustamante et al., 2019); (Chow et al., 2019); (Lochhead et al., 2019); (Morecroft et al., 2019);(Shannon et al., 2019); (North et al., 2019); (Weng et al., 2019); (Chausson et al., 2020); (Nunes et al., 2020);(Ontl et al., 2020);(Ota et al., 2020); (Seddon et al., 2020a);(Seddon et al., 2020b); (Sinay and Carter, 2020);(Takata and Hanasaki, 2020);(von Holle et al., 2020);(Dooley et al., 2021); (Tagliari et al., 2021)		(Lausche et al., 2013);(Crist, 2015);(Krosby et al., 2010); (Schmitz et al., 2015); (Thompson et al., 2017); (Timpane-Padgham et al., 2017); (Keeley et al., 2018a); (Morecroft et al., 2019); (D'Aloia et al., 2019); (Gray et al., 2020); (von Holle et al., 2020); (Lavorel et al., 2020)		(Lusiana et al., 2012; Smith et al., 2013);(Murthy, 2013);(Lasco et al., 2014);(Barral et al., 2015);(Coq-Huelva et al., 2017);(Quandt et al., 2017);(Hernández-Morcillo et al., 2018);(Sida et al., 2018);(Schoeneberger et al., 2012);(Apuri et al., 2018);(Smith et al., 2021);(Minang et al., 2014);(Williams et al., 2021); (Ogada et al., 2020);(Elagib and Al-Saidi, 2020)
	Adaptive capacity/ resilience		(Bustamante et al., 2019);(Seddon et al., 2020a);(Seddon et al., 2020b);		(Krosby et al., 2010); (Lausche et al., 2013); (Timpane-Padgham et		(Sendzimir et al., 2011);(Lusiana et al., 2012);(Murthy, 2013);(Lasco et al., 2014);(Mbow

			(Seddon et al., 2019);(Lochhead et al., 2019);(Morecroft et al., 2019);(North et al., 2019);(Rahman et al., 2019);(Chausson et al., 2020); (Van Langevelde et al., 2020);(White and Razgour, 2020);(Donatti et al., 2020);(Nunes et al., 2020);(Ontl et al., 2020);(Ota et al., 2020);(Tagliari et al., 2021)		al., 2017);(Donatti et al., 2020);(Morecroft et al., 2019);(von Holle et al., 2020);(White and Razgour, 2020);(Schmeller et al., 2020);(Gibb et al., 2020)		et al., 2014b);(Varela-Ortega et al., 2016);(Clark and Tilman, 2017);(Coq-Huelva et al., 2017);(Thierfelder et al., 2017);(Coulibaly et al., 2017);(Quandt et al., 2017);(Hernández-Morcillo et al., 2018);(Charles et al., 2013);(Schoeneberger et al., 2012);(Apuri et al., 2018); (Kmoch et al., 2018);(Minang et al., 2014);(Williams et al., 2021);(Elagib and Al-Saidi, 2020; Ogada et al., 2020);(IPCC, 2019)
Geophysical	Physical feasibility		(Bustamante et al., 2019);(Moomaw et al., 2019);(Morecroft et al., 2019); (Shannon et al., 2019);(Nunes et al., 2020)	L E	(Lausche et al., 2013);(Worboys et al., 2016);(Jones et al., 2020)		Coulibaly, 2017 #51};(Hernández-Morcillo et al., 2018);(Martin et al., 2020);(Dhyani et al., 2021);(IPCC, 2019)
	Land use change enhancement potential		(Bustamante et al., 2019);(Morecroft et al., 2019); (North et al., 2019);(Seddon et al., 2019);(Shannon et al., 2019);(Chausson et al., 2020); (Favretto et al., 2020);(Fleischman et al., 2020);(Nunes et al., 2020);(Seddon et al., 2020a; Seddon et al., 2020b);(von Holle et al., 2020);(Dooley et al., 2021)		(Lausche et al., 2013);(Morecroft et al., 2019);(Lavorel et al., 2020);(Chausson et al., 2020);(Seddon et al., 2020a)		(Lasco et al., 2014);(Mbow et al., 2014b);(Coulibaly et al., 2017);(Hernández-Morcillo et al., 2018);(Williams et al., 2021);(Martin et al., 2020);(Ogada et al., 2020);(Dhyani et al., 2021);(Elagib and Al-Saidi, 2020);(IPCC, 2019)

	Hazard risk reduction potential		(Bustamante et al., 2019); (Morecroft et al., 2019); (North et al., 2019); (Rahman et al., 2019); (Seddon et al., 2020a); (Seddon et al., 2019); (Shannon et al., 2019); (Nunes et al., 2020); (Takata and Hanasaki, 2020)		(Chausson et al., 2020); (Seddon et al., 2020a); (Morecroft et al., 2019); (Donatti et al., 2020)		(Lasco et al., 2014);(Mbow et al., 2014b);(Coulibaly et al., 2017);(Abdulai et al., 2018);(Hernández-Morcillo et al., 2018);(Charles et al., 2013);(Schoeneberger et al., 2012);(Apuri et al., 2018);(Kmoch et al., 2018);(Minang et al., 2014);(Williams et al., 2021);(Ogada et al., 2020)

Table SMCCB FEASIB.4: Feasibility assessment of land and ecosystem transition adaptation options: improved cropland management (including…), efficient livestock systems, livelihood diversification, and water use efficiency and water resource management.

		Improved cropland management		**Efficient livestock system**		**Livelihood diversification**		**Water use efficiency and water resource management**	
	Evidence	High		Medium		High		High	
	Agreement	Medium		High		High		Medium	
Economic	Microeconomic viability		(Sharma et al., 2015);(Brandes et al., 2016);(Agegnehu and Amede, 2017);(Lalani et al., 2017);(Thierfelder et al., 2017);(Aryal et al., 2018c);(Aryal et al., 2020a);(Bedeke et al., 2019);(TerAvest et al., 2019a);(Lunduka et al., 2019);(Adams et al., 2020);(Debie, 2020b);		(Rivera-Ferre et al., 2016);(Ericksen and Crane, 2018) (Gaughan et al., 2019);(Schauberger et al., 2020);(Thomasz et al., 2020);(Wreford and Topp, 2020);(Ghahramani et al., 2020)		(Goulden et al., 2013);(Ford et al., 2014);(Oberlack and Eisenack, 2014);(Liu and Lan, 2015);(Martin and Lorenzen, 2016);(Barrett, 2013);(Gautam and Andersen, 2016);(Makate et al., 2016);(Orchard et al., 2016);(Torell et al., 2017a);(Baird and Hartter, 2017);(Nyantakyi-Frimpong, 2017);(Schuhbauer et al., 2017);(Asfaw		(Foster and Cota, 2014);(Mandryk et al., 2017);(Song et al., 2018);(Herwehe and Scott, 2018);(de Frutos Cachorro et al., 2018);(Koech and Langat, 2018);(Narayanamoorthy et al., 2020);(Panigrahi et al., 2021)

		🟦		🟦		🟦	et al., 2018);(Kihila, 2018);(Radel et al., 2018);(Tian and Lemos, 2018);(Asfaw et al., 2019);(Adam and Osbahr, 2019);(Brown et al., 2019);(Nguyen et al., 2019a);(Rosyida et al., 2019);(Sina et al., 2019);(Buechler and Lutz-Ley, 2020);(Ng'ang’a and Crane, 2020);(Ojea et al., 2020);(Salam and Bauer, 2020);(Kassegn and Endris, 2021);(Bhowmik et al., 2021);(Mohammed et al., 2021); (Nnadi et al., 2021);(Rahut et al., 2021);(Umamaheswari et al., 2021);	🟦	
	Macroeconomic viability	🟦	(Gill, 2014);(Agegnehu and Amede, 2017);(Mottaleb et al., 2017);(S. et al., 2018b);(McFadden et al., 2019);(Shah and Wu, 2019b); (Aryal et al., 2020a);(Debie, 2020a);(Li et al., 2020)	🟦	(Rivera-Ferre et al., 2016);(Thomasz et al., 2020);(Pardo and del Prado, 2020);	🟦	(Ford et al., 2014);(Wilson, 2014);(Alobo Loison, 2015);(Tanner et al., 2015);(Gautam and Andersen, 2016);(Baird and Hartter, 2017);(Torell et al., 2017b);(Asfaw et al., 2018);(Brown et al., 2019);(Sani Ibrahim et al., 2019);(Adzawla et al.,	🟦	(de Frutos Cachorro et al., 2018);(Herwehe and Scott, 2018);(Singh et al., 2020)

							2020);(Ojea et al., 2020);(Salam and Bauer, 2020);(Rahut et al., 2021)		
	Socio-economic vulnerability reduction potential		(Gill, 2014);(Keil et al., 2019);(Kannan and Ramappa, 2017); (Keil et al., 2017);(Hörner and Wollni, 2020a);(Hörner and Wollni, 2020b);(TerAvest et al., 2019b);(Lalani et al., 2017);(Acevedo et al., 2020b)		(Escarcha et al., 2018);(Pardo and del Prado, 2020);(Thomasz et al., 2020);(Schauberger et al., 2020)		(Goulden et al., 2013);(Barrett, 2013);(Cannon, 2014);(Ford et al., 2014);(Oberlack and Eisenack, 2014);(Liu and Lan, 2015);(Gautam and Andersen, 2016);(Makate et al., 2016);(Orchard et al., 2016);(Anderson et al., 2017);(Baird and Hartter, 2017);(Torell et al., 2017a);(Schuhbauer et al., 2017);(Asfaw et al., 2018);(Asfaw et al., 2019);(Adam and Osbahr, 2019);(Brown et al., 2019);(Rosyida et al., 2019);;(Sani Ibrahim et al., 2019);(Tian and Lemos, 2018);(Buechler and Lutz-Ley, 2020);(Sina et al., 2019);(Liu et al., 2020);(Maharjan et al., 2020);(Ng'ang’a and Crane, 2020);(Ojea et al., 2020);(Sarker et al., 2020);(Biswas		(de Frutos Cachorro et al., 2018);(Koech and Langat, 2018);(Singh, 2018);(Shyam et al., 2020)(Singh et al., 2020);(Narayanamoorthy et al., 2020);(Panigrahi et al., 2021)

							and Mallick, 2021);(Rahut et al., 2021);(Umamaheswari et al., 2021);(Voss, 2021)		
	Employment and productivity enhancement potential		(Das et al., 2017);(Jat et al., 2014);(Ernst et al., 2016);(Batabyal et al., 2017);(Thierfelder et al., 2017);(S. et al., 2018a);(Sarkar et al., 2018);(Yan et al., 2020); (Du et al., 2018); (Zhao et al., 2020);(Hörner and Wollni, 2020a); (Agegnehu and Amede, 2017);(Adams et al., 2020);(Adolwa et al., 2019); (Mutuku et al., 2020);		(Rivera-Ferre et al., 2016);(Escarcha et al., 2018);(Ghahramani et al., 2020)		(Barrett, 2013);(Ford et al., 2014);(Oberlack and Eisenack, 2014);(Liu and Lan, 2015); (Gautam and Andersen, 2016);(Herrero et al., 2016);(Makate et al., 2016);(Orchard et al., 2016); (Paudel Khatiwada et al., 2017);(Asfaw et al., 2018);(Asfaw et al., 2019);(Fang et al., 2018);(Radel et al., 2018);(Tian and Lemos, 2018);(Brown et al., 2019);(Adam and Osbahr, 2019);(Sani Ibrahim et al., 2019);(Buechler and Lutz-Ley, 2020);(Sina et al., 2019); (Liu et al., 2020); (Maharjan et al., 2020);(Nguyen et al., 2019a);(Salam and Bauer, 2020);		(Levidow et al., 2014);(Pittock et al., 2017);(Narayanamoorthy et al., 2020);(Panigrahi et al., 2021)
Technological	Technical resource availability		(Findlater et al., 2019); (Dougill et al., 2017); (Aryal		(Escarcha et al., 2018);(Gaughan et al.,		(Ford et al., 2014);(Alobo Loison,		(Foster and Cota, 2014);(Ratna Reddy et al.,

			et al., 2018a);(Aryal et al., 2018b);(Bhattacharyya et al., 2016);(Khatri-Chhetri et al., 2016); (Bhattacharya et al., 2017); (Sova et al., 2018b); (Acevedo et al., 2020a)		2019);(Schauberger et al., 2020);(Paul et al., 2020)		2015);(Liu and Lan, 2015);(Shackleton et al., 2015);(Gautam and Andersen, 2016);(Makate et al., 2016);(Baird and Hartter, 2017);(Brown et al., 2017);(Schuhbauer et al., 2017);(Tian and Lemos, 2018);(Umamaheswari et al., 2021)		2017);(Koech and Langat, 2018; Greenland et al., 2019);(Singh et al., 2020);(Garg et al., 2020);(Misquitta et al., 2021) (Jordán and Speelman, 2020)
	Risks mitigation potential		(Aryal et al., 2015; Khatri-Chhetri et al., 2017); Bhattacharyya et al., 2016; (Bhattacharyya et al., 2015);(Bhattacharya et al., 2017); (Shah and Wu, 2019a)		(Escarcha et al., 2018);(Pardo and del Prado, 2020);(Schauberger et al., 2020);(Shukla et al., 2019) (Ghahramani et al., 2020)		(Barrett, 2013);(Liu and Lan, 2015); (Makate et al., 2016);(Baird and Hartter, 2017);(Schuhbauer et al., 2017);(Fang et al., 2018);(Tian and Lemos, 2018);(Adam and Osbahr, 2019);(Asfaw et al., 2019);(Salam and Bauer, 2020);(Mohammed et al., 2021)		(Gray and Srinidhi, 2013);(Yazdi et al., 2013);(Chaudhari and Mishra, 2015);(Karlberg et al., 2015); (Grafton et al., 2018);(Singh, 2018);(Garg et al., 2020);(Shyam et al., 2020)
Institutional	Political acceptability		(Amjath-Babu et al., 2019); (Reddy et al., 2020a); (Kannan and Ramappa, 2017);(Bhattacharyya et al., 2016); (Dougill et al., 2017);	NE			(Ford et al., 2014);(Shackleton et al., 2015);(Rigg and Oven, 2015)(Nightingale, 2017);(Ober and Sakdapolrak, 2020)		(Levidow et al., 2014);(Greenland et al., 2019)
	Legal and regulatory acceptability	LE	(Amjath-Babu et al., 2019); (Reddy et al., 2020b)		(Escarcha et al., 2018);(Pardo and del Prado, 2020);		(Brown et al., 2017);(Butler et al., 2020);(Shapiro-Garza et al., 2020)	NE	
	Institutional capacity and		(Aryal et al., 2020a); (Aryal et al., 2020b);		(Escarcha et al.,		(Barrett, 2013);(Liu and Lan,		(Gupta, 2014);(Chaudhari and Mishra,

	administrative feasibility		(Chapke and Tonapi, 2018); (Kannan and Ramappa, 2017); (Dougill et al., 2017); (Sova et al., 2018a)		2018);(Paul et al., 2020)		2015);(Shackleton et al., 2015);(Herrero et al., 2016);(Makate et al., 2016);(Nightingale, 2017);(Torell et al., 2017a);(Tian and Lemos, 2018);(Asfaw et al., 2019); (Brown et al., 2019); (Sina et al., 2019);(Adzawla et al., 2020);(Rahut et al., 2021); (Voss, 2021); (Bhowmik et al., 2021)		2015);(Mondal et al., 2016);(Ley, 2017);(Villamayor-Tomas and García-López, 2017);(Kumari Rigaud et al., 2018);(Greenland et al., 2019);(Koff et al., 2020);(Singh et al., 2020);
	Transparency and accountability potential	LE	(Seshia Galvin, 2018)	NE			(Brown et al., 2019); (Salam and Bauer, 2020); (Makate et al., 2016); (Schuhbauer et al., 2017)		(Singh et al., 2020);
Socio-cultural	Social co-benefits (health, education)		(Farnworth et al., 2017); (Hörner and Wollni, 2020b); (Lunduka et al., 2019);		(Escarcha et al., 2018);(Salmon et al., 2018)		(Barrett, 2013); (Gautam and Andersen, 2016); (Ford et al., 2014);(Torell et al., 2017a); (Sani Ibrahim et al., 2019); (Nyantakyi-Frimpong, 2017);(Buechler and Lutz-Ley, 2020); (Orchard et al., 2016); (Brown et al., 2019);(Tian and Lemos, 2018); (Makate et al., 2016);(Fang et al., 2018); (Schuhbauer et al., 2017); (Adam and Osbahr, 2019; Sina et al., 2019); (Kassegn and		(Syme et al., 2015);(Barchiesi and Córdoba);(Hellin et al., 2018);(Singh and Basu, 2020)

		🟦		🟦		🟦	Endris, 2021);(Nguyen et al., 2019b); (Rosyida et al., 2019); (Maharjan et al., 2020); (Adzawla et al., 2020); (Woodhouse and McCabe, 2018); (Sarker et al., 2020);(Nnadi et al., 2021)	🟦	
	Socio-cultural acceptability	🟦	(Aryal et al., 2020a);(Aryal et al., 2018a); (Tripathi and Mishra, 2017); (Kannan and Ramappa, 2017); (Keil et al., 2017);(Findlater et al., 2019);	🟦	(Escarcha et al., 2018);(Salmon et al., 2018);(Rivera-Ferre et al., 2016);(Ericksen and Crane, 2018)	🟦	(Barrett, 2013); (Goulden et al., 2013);(Gautam and Andersen, 2016);(Ford et al., 2014); (Asfaw et al., 2018); (Asfaw et al., 2019); (Torell et al., 2017a); (Alobo Loison, 2015); (Radel et al., 2018);(Buechler and Lutz-Ley, 2020); (Brown et al., 2019);(Tian and Lemos, 2018); (Makate et al., 2016);(Adam and Osbahr, 2019);(Kassegn and Endris, 2021); (Umamaheswari et al., 2021); (Rosyida et al., 2019); (Ojea et al., 2020); (Maharjan et al., 2020);(Liu et al., 2020);; (Lenaiyasa et al., 2020);(Woodhouse and McCabe, 2018);(Voss,	🟦	(Figueiredo and Perkins, 2013);(Levidow et al., 2014);(Koech and Langat, 2018);(Greenland et al., 2019);(Singh and Basu, 2020);(Jordán and Speelman, 2020)

		▨		▨		▨	2021); (Ng'ang'a and Crane, 2020)	▨	
	Social and regional inclusiveness	▨	(Bhattacharya et al., 2017); (Aryal et al., 2018a),(Aryal et al., 2018b);(Keil et al., 2019); (Kannan and Ramappa, 2017); (Keil et al., 2017); (Li et al., 2020); Ntshangase et al., 2018; (Somasundaram et al., 2020);(Van Hulst and Posthumus, 2016)	▨	(Escarcha et al., 2018);(Rivera-Ferre et al., 2016)	■	(Barrett, 2013); (Gautam and Andersen, 2016); (Wilson, 2014); (Asfaw et al., 2018); (Asfaw et al., 2019);(Torell et al., 2017a); (Liu and Lan, 2015);(Radel et al., 2018); (Nyantakyi-Frimpong, 2017);(Buechler and Lutz-Ley, 2020); (Orchard et al., 2016); (Brown et al., 2019); (Tian and Lemos, 2018); (Makate et al., 2016); (Fang et al., 2018); (Asravor, 2018);(Adam and Osbahr, 2019);(Liao et al., 2015);(Shapiro-Garza et al., 2020); (Kassegn and Endris, 2021); (Nguyen et al., 2019b); (Umamaheswari et al., 2021);(Rosyida et al., 2019);(Rahut et al., 2021); (Ojea et al., 2020); Mohammmed et al. 2021; (Maharjan et al., 2020); (Liu et al., 2020);(Lenaiyasa et al., 2020);(Williams et al., 2021)	▨	(Jägermeyr et al., 2015);(Karlberg et al., 2015);(MacDonald et al., 2016);(Song et al., 2018);(Figueiredo and Perkins, 2013);(Singh and Basu, 2020);
	Gender equity	▨	(Gill, 2014); (Wekesah et	░	(Luqman et al.,	▨	(Erwin et al., 2021);	░	(Theis et al., 2018);(Najjar et

			al., 2019); (Bhattacharya et al., 2017);(Aryal et al., 2015);(OECD/FAO, 2017)		2018);(Salmon et al., 2018)		(Barrett, 2013); (Gautam and Andersen, 2016); (Ford et al., 2014); (Asfaw et al., 2018); (Adzawla et al., 2020); (Asfaw et al., 2019); (Torell et al., 2017a);(Nyantakyi-Frimpong, 2017); (Buechler and Lutz-Ley, 2020); (Orchard et al., 2016); (Makate et al., 2016); Asravor, 2018 #487};(Adam and Osbahr, 2019);(Kassegn and Endris, 2021); (Umamaheswari et al., 2021);(Voss, 2021); (Rahut et al., 2021); (Ojea et al., 2020);(Nnadi et al., 2021) ; (Sarker et al., 2020); (Ng'ang’a and Crane, 2020);(Maharjan et al., 2020)		al., 2019);(Imburgia et al., 2020) (Imburgia, 2019); (Caretta and Börjeson, 2015) (Tesfamariam and Hurlbert, 2017)
	Intergenerational equity	NA		NE			(Barrett, 2013);(Gautam and Andersen, 2016); (Ford et al., 2014); (Asfaw et al., 2018); (Asfaw et al., 2019); (Torell et al., 2017a); (Nyantakyi-Frimpong, 2017); (Buechler and Lutz-Ley, 2020); (Orchard et	LE	(Syme et al., 2015)

							al., 2016); (Brown et al., 2019); (Tian and Lemos, 2018); 2018; (Makate et al., 2016); (Schuhbauer et al., 2017);; (Voss, 2021); (Rahut et al., 2021); (Woodhouse and McCabe, 2018); (Umamaheswari et al., 2021);(Ng'ang’a and Crane, 2020); (Biswas and Mallick, 2021); (Ojea et al., 2020); (Liu et al., 2020)		
Environmental/ ecological	Ecological capacity		(Schulte et al., 2017); (Agegnehu and Amede, 2017); (Shah and Wu, 2019b); (Gonzalez-Sanchez et al., 2019)		(Accatino et al., 2019);(Salmon et al., 2018);(Rivera-Ferre et al., 2016)		(Goulden et al., 2013);(Wilson, 2014);(Herrero et al., 2016); (Liu and Lan, 2015); (Gautam and Andersen, 2016);(Singh and Basu, 2020) ;(Mutabazi et al., 2015); (Butler et al., 2020);(Sayatham and Suhardiman, 2015); (Rosyida et al., 2019); (Rahut et al., 2021); (Ojea et al., 2020); (Woodhouse and McCabe, 2018);		(Barchiesi and Córdoba);(Hellin et al., 2018);(Mondal et al., 2016);(Ley, 2017);(Ratna Reddy et al., 2017); (Grafton et al., 2018);(Singh, 2018);(Garg et al., 2020);(Koech and Langat, 2018);(de Frutos Cachorro et al., 2018);
	Adaptive capacity/ resilience		(Du et al., 2021); (Aryal et al., 2020a); (Mottaleb et al., 2017); Patra et al., 2020; (S. et al., 2018a);(Sarkar		(Ericksen and Crane, 2018);(Salmon et al., 2018);(Ghahramani et al., 2020);(Pardo and del		(Goulden et al., 2013);(Wilson, 2014);(Tanner et al., 2015);(Cochrane and Cafer, 2018);(Torell		(Gain et al., 2013);(Gray and Srinidhi, 2013);(Chaudhari and Mishra, 2015);(Barchiesi and Córdoba);(Ley, 2017);(Villama

			et al., 2018);(Zomer et al., 2017);(Mayer et al., 2018);(Adams et al., 2020);(Mutuku et al., 2020); (Shah and Wu, 2019b);(Gonzalez-Sanchez et al., 2019);(Thierfelder et al., 2017);(Somasundaram et al., 2020);(Sova et al., 2018b);(McFadden et al., 2019)		Prado, 2020);(Schauberger et al., 2020);(Shukla et al., 2019)		et al., 2017a);(Barrett, 2013);(Brown et al., 2019);(Gautam and Andersen, 2016); (Radel et al., 2018)		yor-Tomas and García-López, 2017);(Koech and Langat, 2018);(Hellin et al., 2018);(Singh, 2018);(Garg et al., 2020);(Shyam et al., 2020);(Jordán and Speelman, 2020)
Geophysical	Physical feasibility		(Aryal et al., 2018d); (Das et al., 2017);(DeFries et al., 2016);(Kannan and Ramappa, 2017); (Keil et al., 2017);(Prestele et al., 2018);(Prestele et al., 2018)		(Ericksen and Crane, 2018);(Escarcha et al., 2018);(Accatino et al., 2019);(Pardo and del Prado, 2020)(Shukla et al., 2019)		(Sayatham and Suhardiman, 2015);(Wise et al., 2016);(Brown et al., 2017);(Shapiro-Garza et al., 2020)		(Barchiesi and Córdoba);(Mondal et al., 2016);l(Ley, 2017);;(Ratna Reddy et al., 2017);(Hellin et al., 2018);(Singh, 2018);(Garg et al., 2020);(Singh et al., 2020)
	Land use change enhancement potential		Shang et al., 2021; (Das et al., 2017);(Aryal et al., 2020b);(S. et al., 2018a);(Yadav et al., 2019);(Mayer et al., 2018);(Wang et al., 2020);(Sommer et al., 2018);(Adams et al., 2020);(Shah and Wu, 2019b);(Gonzalez-Sanchez et al., 2019);(Ogle et al., 2019);(VandenBygaart, 2016)		(Shukla et al., 2019) (Rivera-Ferre et al., 2016);(Ericksen and Crane, 2018);(Escarcha et al., 2018);(Accatino et al., 2019);		(Goulden et al., 2013);(Wilson, 2014);(Liu and Lan, 2015);(Herrero et al., 2016);(Nyantakyi-Frimpong, 2017);(Shapiro-Garza et al., 2020)		(Mondal et al., 2016)
	Hazard risk	NA		NA			(Mutabazi et al.,	LE	(Karlberg et al., 2015);(Barchies

	reduction potential					🟦	2015);(Wan et al., 2016);(Anderson et al., 2017);(Adam and Osbahr, 2019);		i and Córdoba);l(Ley, 2017);(Hellin et al., 2018);(Hostettler et al., 2019);(Shyam et al., 2020);(Singh et al., 2020)

SMCCB FEASIB.1.3 *Feasibility Assessment of Adaptation Options in Urban and Infrastructure System Transitions*

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Table SMCCB FEASIB.5: Feasibility assessment of urban and infrastructure transition adaptation options: sustainable land use and urban planning, green infrastructure and ecosystem service, and sustainable water management.

		Sustainable land- use and urban planning		**Green infrastructure and ecosystem service**		**Sustainable water management**	
	Evidence	Medium		Medium		Robust	
	Agreement	High		High		Medium	
Economic	Microeconomic viability	🟦	(Georgeson et al., 2016);(Woodruff et al., 2018);(Shi and Varuzzo, 2020);(Siders and Keenan, 2020);(Carey, 2020);(Jain and Bazaz, 2020)	🟦	No new evidence since SR 1.5	🟦	No new evidence since SR 1.5
	Macroeconomic viability	🟦	(Meerow, 2019);(Zhang et al., 2019)	LE		NE	
	Socio-economic vulnerability reduction potential	🟦	(Keenan et al., 2018);(Anguelovski et al., 2019a);(Anguelovski et al., 2019b);(Shokry et al., 2020);(Elliott, 2019);(Paganini, 2019);(Jain and Bazaz, 2020)	🟦	(Anguelovski et al., 2019c); (Buijs et al., 2019); (Escobedo et al., 2019); (Filazzola et al., 2019); (Hewitt et al., 2020); (Langemeyer and Connolly, 2020); (Nieuwenhuijsen, 2020);(Venter et al., 2020a); (Venter et al., 2020b)	🟦	(Liu and Jensen, 2018); (Oral et al., 2020);(Jensen and Nair, 2019)
	Employment and productivity enhancement potential	🟦	(Woodruff et al., 2018)	NE		NE	
Technological	Technical resource availability	🟦	(Serre and Heinzlef, 2018);(Szewrański et al.,	NE		🟦	No new evidence since SR 1.5

			2018);(Goh, 2020);(Colven, 2020);(Hasan et al., 2019);(Fitzgibbons and Mitchell, 2019);(Heikkinen et al., 2019)				
	Risks mitigation potential		LE (limited new evidence since SR1.5)		(Anguelovski et al., 2019c)		No new evidence since SR 1.5
Institutional	Political acceptability		(Biesbroek et al., 2015);(Wachsmuth et al., 2016)	LE			No new evidence since SR 1.5
	Legal and regulatory acceptability		(DuPuis and Greenberg, 2019)				No new evidence since SR 1.5
	Institutional capacity and administrative feasibility		(Di Gregorio et al., 2019);(Zen et al., 2019)		(Davies et al., 2019);(Dorst et al., 2019);(Zwierzchowska et al., 2019)		(Chu et al., 2018);(Williams et al., 2018);(Herslund and Mguni, 2019);(Leigh and Lee, 2019);(Pelling et al., 2018);(Sletto et al., 2019);(Esmail and Suleiman, 2020);(Krueger et al., 2019);(Feingold et al., 2018);
	Transparency and accountability potential		LE (limited new evidence since SR1.5)	LE		NE	
Socio-cultural	Social co-benefits (health, education)		(Keeler et al., 2019);(Meerow, 2019);(Raymond et al., 2017);(Spaans and Waterhout, 2017);(Klinenberg, 2019)		(Escobedo et al., 2019); (Filazzola et al., 2019); (Hewitt et al., 2020); (Nieuwenhuijsen, 2020);(Venter et al., 2020a)		(Dong et al., 2020)
	Socio-cultural acceptability		(Siders, 2019);(Siders and Keenan, 2020);(Koslov, 2019);		No new evidence since SR 1.5		No new evidence since SR 1.5

	Social and regional inclusiveness	🟦	(Chu, 2018);(Fainstein, 2018);(Rosenzweig et al., 2018);(Chu and Michael, 2019);(Pelling and Garschagen, 2019);(Ranganathan and Bratman, 2021);(Araos, 2020);(Rasmussen et al., 2021)	🟦	(Anguelovski et al., 2019c);(Buijs et al., 2019);(Hewitt et al., 2020);(Langemeyer and Connolly, 2020);(Nieuwenhuijsen, 2020);(Venter et al., 2020a);(Venter et al., 2020b)	🟦	(Chu et al., 2018);(Williams et al., 2018);(Leigh and Lee, 2019);(Pelling et al., 2018);(Sletto et al., 2019);(van den Brandeler et al., 2019)
	Gender equity	NE		🟦	(Anguelovski et al., 2019c);(Buijs et al., 2019);(Filazzola et al., 2019);(Hewitt et al., 2020);(Nieuwenhuijsen, 2020);(Venter et al., 2020a);(Venter et al., 2020b)	NE	
	Intergenerational equity	🟦	No new evidence since SR 1.5	🟦		🟦	No new evidence since SR 1.5
Environmental/ecological	Ecological capacity	🟦	Limited evidence since SR1.5)	🟦	(Filazzola et al., 2019)	🟦	No new evidence since SR 1.5
	Adaptive capacity/ resilience	🟦	Limited evidence since SR1.5)	🟦	No new evidence since SR 1.5	🟦	(Chan et al., 2018);(Nguyen et al., 2019);(Dai et al., 2018);
Geophysical	Physical feasibility	🟦	Limited evidence since SR1.5)	🟦	No new evidence since SR 1.5	🟦	(Chan et al., 2018);(Nguyen et al., 2019)
	Land use change enhancement potential	🟦	Limited evidence since SR1.5)	🟦	No new evidence since SR 1.5	🟦	No new evidence since SR 1.5
	Hazard risk reduction potential	🟦	Limited evidence since SR1.5)	🟦	No new evidence since SR 1.5	🟦	No new evidence since SR 1.5

SMCCB FEASIB.1.4 Feasibility Assessment of Adaptation Options in Overarching Adaptation Options

Table SMCCB FEASIB.6: Feasibility assessment of overarching adaptation options: disaster risk management, climate service, including EWS, and risk spreading and sharing.

	Disaster risk management	**Climate services**	**Risk spreading and sharing**
Evidence	High	High	High
Agreement	High	High	Medium

Economic	Microeconomic viability		(IPCC, 2012);(Mavhura et al., 2013);(Yu and Gillis, 2014);(Johnson and Abe, 2015);(Mawere and Mubaya, 2015);(Archer, 2016);(Kull et al., 2016);(Rose, 2016);(Watanabe et al., 2016);(Marchezini, 2020);(Soetanto et al., 2020);(Gartrell et al., 2020);(Pokhrel et al., 2021);(Sauka, 2020)		(Amegnaglo et al., 2017);(Parton et al., 2019);(Vaughan et al., 2019);(Perrels, 2020); (Köberl et al., 2021);(Brown et al., 2018)		(Marcantonio and Kayitakire, 2017);(Mutaqin and Usami, 2019);(Schäfer et al., 2019);(Jarzabkowski et al., 2019);(Ali et al., 2020); (Tesselaar et al., 2020a; Tesselaar et al., 2020c); (Thinda et al., 2020);(Alam et al., 2020); Tesselaar et al., 2020
	Macroeconomic viability		(Alcántara-Ayala et al., 2020);(Islam et al., 2020b);(Islam et al., 2020c);(Nyandiko, 2020);(Williams et al., 2020b);(Geekiyanage et al., 2021);(Williams et al., 2021)	L E	(Perrels, 2020)		(Linnerooth-Bayer and Hochrainer-Stigler, 2015);(Porrini et al., 2019);(Schäfer et al., 2019);(Broberg, 2020);
	Socio-economic vulnerability reduction potential		(Forino et al., 2019)		(Parton et al., 2019);(Bruno Soares and Buontempo, 2019);(Vaughan et al., 2019);(Perrels, 2020);(Brown et al., 2018)		(Linnerooth-Bayer and Hochrainer-Stigler, 2015);(Schäfer et al., 2019);(Thinda et al., 2020)
	Employment and productivity enhancement potential		(Khalil et al., 2020);(Williams et al., 2021)		(Brown et al., 2018);(Amegnaglo et al., 2017);(Parton et al., 2019);(Vaughan et al., 2019);(Perrels, 2020);		

Technological	Technical resource availability		(Marchezini, 2020);(Nyandiko, 2020);(Smucker et al., 2020); (Soetanto et al., 2020);(Williams et al., 2020b) ;(Ali et al., 2021) ;(Mena and Hilhorst, 2021);(Geekiyanage et al., 2021); (Goniewicz and Burkle, 2019);(Obi et al., 2021);(Singh et al., 2021);Daron, 2021 #13865};(Williams et al., 2021)		(Buontempo et al., 2019);(Dorward et al., 2021);(Findlater et al., 2021)	C	(Schäfer et al., 2019)
	Risks mitigation potential		(Alcántara-Ayala et al., 2020);(Ali et al., 2021);(Obi et al., 2021); (Pokhrel et al., 2021)		(Hobday et al., 2018);(Daly and Dessai, 2018); (Larosa and Mysiak, 2020);(Köberl et al., 2021)	C	(Schäfer et al., 2019);(Thinda et al., 2020) ; (Jørgensen et al., 2020);(Tesselaar et al., 2020b);(Lucas and Booth, 2020);(Miao, 2020)
Institutional	Political acceptability		(Smucker et al., 2020);(Ruane et al., 2020)		(Harjanne, 2017);(Bruno Soares and Buontempo, 2019);(Hewitt et al., 2020);(Webber, 2017)		(Linnerooth-Bayer and Hochrainer-Stigler, 2015)
	Legal and regulatory acceptability		(Booth et al., 2020);(Ali et al., 2021);(Smucker et al., 2020);(Islam et al., 2020c)		(Singh et al., 2018);(Bruno Soares et al., 2018);(Bruno Soares and Buontempo, 2019);(Hewitt et al., 2020)		(Loisel et al., 2020) (Su, 2020);(Jegede et al., 2020)
	Institutional capacity and administrative feasibility		(Islam et al., 2020b);(Islam et al., 2020c);(Albris et al., 2020);(Smucker et al., 2020);(Villeneuve, 2021);(Booth et al., 2020); (Islam et al.,		(Bruno Soares et al., 2018);(Vincent et al., 2018);(Daly and Dessai, 2018);(Tall et al., 2018);(Bruno Soares and Buontempo,		(Schäfer et al., 2019); (Budhathoki et al., 2019);(Edwards et al., 2020)

			2020b);(Islam et al., 2020c);(Goryushina, 2021); (Mena and Hilhorst, 2021);(Marchezini, 2020);(Räsänen et al., 2020);(Ferreira Costa, 2020);(Nyandiko, 2020); (Soetanto et al., 2020);(Sauka, 2020);(Islam et al., 2020a);(Ruane et al., 2020);(Wamsler and Johannessen, 2020);(Williams et al., 2020b);(Yumagulova et al., 2021)		2019);(Harvey et al., 2019);(Mahon et al., 2019);(Vaughan et al., 2019);(Perrels, 2020);(Bruno Soares and Buontempo, 2019);(Daniels et al., 2020);(Larosa and Mysiak, 2020);(Tesfaye et al., 2020)		
	Transparency and accountability potential		(Islam et al., 2020c);(Nyandiko, 2020);(Geekiyanage et al., 2021);(Williams et al., 2020b);(Peng et al., 2020);(Ruane et al., 2020; Ali et al., 2021);(Glantz and Pierce, 2021);(Sharma and Sharma, 2021)		(Vincent et al., 2018);(Tall et al., 2018);(Bruno Soares and Buontempo, 2019);(Harvey et al., 2019);(Mahon et al., 2019);(Perrels, 2020);		No new evidence since SR1.5
Socio-cultural	Social co-benefits (health, education)		(Cuaton and Su, 2020); (Ali et al., 2021);(Smucker et al., 2020);(Ruszczyk et al., 2020)		(Hunt et al., 2017)		(Fisher et al., 2019); (Alam et al., 2020)
	Socio-cultural acceptability		(Hosen et al., 2020);(Ngin et al., 2020);(Peng et al., 2020);(Webb, 2020); (Ali et al., 2021); (Glantz and Pierce, 2021);(Rasmussen et al., 2021)		(Alexander and Dessai, 2019);(Amegnaglo et al., 2017);(Buontempo et al., 2019);(Dorward et al., 2021);(Williams et al., 2020a);(Martínez-Barón et al., 2021);		(Ali et al., 2020); (Jørgensen et al., 2020)

	Social and regional inclusiveness		(Geekiyanage et al., 2021); (Cuaton and Su, 2020);(Gartrell et al., 2020); (Villeneuve, 2021); (Ali et al., 2021); (Ngin et al., 2020);(Islam et al., 2020a); (Bronen et al., 2020); (Hosen et al., 2020);(Singh et al., 2020); (Bordner et al., 2020); (Sharma and Sharma, 2021);(Crawford et al 2021, (Ruszczyk et al., 2020);(Anderson and Renaud, 2021);(Kenney and Phibbs, 2020);(Son et al., 2021);(Yumagulova et al., 2021)		(Daly and Dessai, 2018);(Tall et al., 2018);(Alexander and Dessai, 2019);(Amegnaglo et al., 2017);(Vaughan et al., 2019);(Dorward et al., 2021);(Williams et al., 2020a);(Martínez-Barón et al., 2021);		(Tesselaar et al., 2020a; Tesselaar et al., 2020c)
	Gender equity		(Hemachandra et al 2020; (Khalil et al., 2020); (Ali et al., 2021); (Seleka et al., 2017); (Ruszczyk et al., 2020);(Gartrell et al., 2020);(Kanfar et al., 2020)		(Venkataraman et al., 2016);(Gumucio et al., 2020)		(Bageant and Barrett, 2017);(Fisher et al., 2019); (Born et al., 2019);(Hillier, 2018); (Taylor and Kumar, 2016);(Cannon et al., 2020)
	Intergenerational equity		(Cuaton and Su, 2020);(Ali et al., 2021); (Pokhrel et al., 2021);(Mburu)	NE			(Linnerooth-Bayer and Hochrainer-Stigler, 2015)
Environmental/ecological	Ecological capacity		No new evidence since SR1.5	NA		NA	
	Adaptive capacity/ resilience		(Kim and Marcouiller, 2020);(Hasan et al., 2019);(Uddin et al., 2020);(Webb, 2020);(Ji and Lee, 2021)		(Brown et al., 2018); (Bruno Soares and Buontempo, 2019);(Hobday et al., 2018);(Köberl et al., 2021);(Martínez-Barón et al., 2021);(Dorward et al., 2021);(Findlater et al., 2021)		(Müller et al., 2017); (Schäfer et al., 2019)
Geophysical	Physical feasibility				(Williams et al., 2020a)	NA	

	Land use change enhancement potential	NA		NA		🟦	No new evidence since SR1.5
	Hazard risk reduction potential	🟦	(Anderson and Renaud, 2021); (Sauka, 2020); (Williams et al., 2021); (Obi et al., 2021);(Pokhrel et al., 2021)	🟦	(Bruno Soares and Buontempo, 2019);(Hobday et al., 2018)	🟦	(Schäfer et al., 2019)

Table SMCCB FEASIB.7: Feasibility assessment of overarching adaptation options: population health and health system, social safety nets, planned relocation and resettlement, and human migration and displacement.

		Population health and health system		**Social safety nets**		**Planned relocation and resettlement**		**Human migration and displacement**	
	Evidence	Medium		Medium		Low		Medium	
	Agreement	High		Medium		Medium		Medium	
Economic	Microeconomic viability	🟦	(Fox et al., 2019);(Paudel and Pant, 2020);(Hayes et al., 2020);(Khurana et al., 2021);	🟦	(Castells-Quintana et al., 2018);(Hansen et al., 2019);(Aleksandrova, 2020);(Centre , 2019);(Mueller et al., 2020)	🟦	{Liu, 2020 #17};(Zickgraf, 2019) (Bronen and Chapin, 2013);(Albert et al., 2018)	🟦	(Mallick et al., 2017);(Suckall et al., 2017);(Obokata and Veronis, 2018);(McLeman, 2018);(Nawrotzki and DeWaard, 2018);(Thober et al., 2018);(Adams and Kay, 2019b);(Cattaneo et al., 2019);(Jacobson et al., 2019);(Semenza and Ebi, 2019);(Natarajan et al., 2019);(Maharjan et al., 2020a);(Sedova and Kalkuhl, 2020);(Hoffmann et al., 2020) (Bragg et al., 2018);(Porst et al., 2020)

	Macroeconomic viability	🟦	(Gilfillan, 2019);(Fox et al., 2019);(Khurana et al., 2021);(Morgan and Fanzo, 2020);(Negev et al., 2021);(Rameshshanker et al., 2021; Watts et al., 2021);(Organization, 2018)	🟦	(Castells-Quintana et al., 2018);(Aleksandrova, 2020)	🟦	(Bronen and Chapin, 2013);(Mortreux et al., 2018);(Miller, 2020);(Albert et al., 2018);(Boston et al., 2021);(Siders, 2019)	🟦	(Adger et al., 2020c)
	Socio-economic vulnerability reduction potential	🟦	(Rohat et al., 2021);(Johnson, 2020);(Schwerdtle et al., 2020);(Kingsley et al., 2021);(Morgan and Fanzo, 2020);(Negev et al., 2021)	🟦	(Castells-Quintana et al., 2018);(Singh et al., 2018);(Centre, 2019);(Hansen et al., 2019);(Ulrichs et al., 2019);(Aleksandrova, 2020);(Fischer, 2020);(Mueller et al., 2020)	🟦	(Wilmsen and Webber, 2015);(Mortreux et al., 2018);(Dannenberg et al., 2019);(Piggott-McKellar et al., 2019a);(Piggott-McKellar et al., 2019b);(Henrique and Tschakert);(Tabe, 2019);(Zickgraf, 2019);(Ajibade et al., 2020);(Liu et al., 2017);(Maharjan et al., 2020a);(See and Wilmsen, 2020);(Thomas and Benjamin, 2020);(Desai et al., 2021);(Johnson et al.);(Maldonado et al., 2021);(Mach et al., 2019b)	🟦	(Wrathall, 2012);(Mallick et al., 2017);(Suckall et al., 2017);(Bragg et al., 2018);(Jessoe et al., 2018);(Obokata and Veronis, 2018);(Banerjee et al., 2019);(Semenza and Ebi, 2019);(Cattaneo et al., 2019);(Thober et al., 2018);(Hoffmann et al., 2020);(Singh et al., 2020b);(Sedova and Kalkuhl, 2020);(McLeman, 2018);(Nawrotzki and DeWaard, 2018);(Adams and Kay, 2019b);(Jacobson et al., 2019);(Natarajan et al., 2019);(Adger et al., 2020c);(Maharjan et al., 2020a);(Porst et al., 2020);
	Employment and	🟦	(Christopher Boyer,	🟦	(Castells-Quintana et	NA	(Kaczan and Orgill-	🟦	(Wrathall, 2012);(Web

	productivity enhancement potential		2020);(Kaufman et al., 2020);(Lee et al., 2020);(Méndez et al., 2020);(Khurana et al., 2021);		al., 2018);(Hansen et al., 2019);(Fischer, 2020);(Mueller et al., 2020)		Meyer, 2020);(Zickgraf, 2019); (Maharjan et al., 2020a)		er, 2017);(Bragg et al., 2018);(Jessoe et al., 2018);(Obokata and Veronis, 2018);(Jacobson et al., 2019);(Semenza and Ebi, 2019);(Maharjan et al., 2020b);(Margaret and Matias, 2020);(Porst et al., 2020);(Sedova and Kalkuhl, 2020); (Singh et al., 2020b);
Technological	Technical resource availability		(Berry et al., 2018);(Ebi et al., 2018);(Hanefeld et al., 2018b);(Runkle et al., 2018);(Austin et al., 2019);(Brooke-Sumner et al., 2019);(Chersich and Wright, 2019);(Fox et al., 2019);(Liao et al., 2019);(Negev et al., 2019);(Albright et al., 2020);(Chiristopher Boyer, 2020);(Hayes et al., 2020);(Hussey and Arku, 2020);(Johnson, 2020);(Lowe et al., 2020);(Negev et al., 2020);(Reed et al., 2020);(Schramm et al.,		(Hansen et al., 2019)		(Graham, 2020);(McNamara and Des Combes, 2015);(Bronen and Chapin, 2013); See and Wilmsen 2020;(Alverio et al., 2021); (Albert et al., 2018)		(Warner, 2018)

		🟦	2020);(Jagals and Ebi, 2021);(Negev et al., 2021) ;(Negev et al., 2021);(Opoku et al., 2021);(Pascal et al., 2021)	🟦		🟦		🟦	
	Risks mitigation potential	🟦	(Lock-Wah-Hoon et al., 2020);(Kouis et al., 2021);(Ligsay et al., 2021)	🟦	(Ulrichs et al., 2019);(Centre , 2019);(Mueller et al., 2020);(Fischer, 2020);(Mueller et al., 2020)	🟦	(Miller, 2020);(Margaret and Matias, 2020);(See and Wilmsen, 2020) (Johnson et al.);(Maldonado et al., 2021);(Mach et al., 2019a);(Piggott-McKellar et al., 2019b); Thomas and Benjamin, 2020)	🟦	(Wrathall, 2012);(Singh, 2019);(Sedova and Kalkuhl, 2020);(Miller, 2020);(Margaret and Matias, 2020);(Adger et al., 2020c);(Hoffmann et al., 2020);(Islam and Shamsuddoha, 2017);(Kaczan and Orgill-Meyer, 2020)
Institutional	Political acceptability	🟦	(Fox et al., 2019);(Lemery et al., 2020);(Lock-Wah-Hoon et al., 2020);(Negev et al., 2021);	🟦	(Aleksandrova, 2020);(Bowen et al., 2020)	🟦	(Zickgraf, 2019); (Kothari, 2014);(Mortreux et al., 2018);(Hughes, 2020); (de Salles Cavedon-Capdeville et al., 2020);(Stanley and Williamson, 2021);(See and Wilmsen, 2020);(Bronen and Chapin, 2013); (Mach and Siders, 2021)	🟦	(Hauer et al., 2020);(McNamara, 2015);(Zickgraf, 2019); (Honarmand Ebrahimi and Ossewaarde, 2019);(Hughes, 2020);(de Salles Cavedon-Capdeville et al., 2020) (Telford, 2018);(McLeman, 2019); (Wiegel et al., 2019) (Warner, 2018);(Käli

									n, 2018);(Deshpande et al., 2019)
	Legal and regulatory acceptability		(Austin et al., 2019);(Gilfillan, 2019);(Lee et al., 2020);(Lock-Wah-Hoon et al., 2020);(Kim et al., 2021);(Tonmoy et al., 2020);(Halabi, 2020);(Ristroph, 2021)		(Aleksandrova, 2020);(Fischer, 2020);		(Kothari, 2014);(Tebboth et al., 2019);(Mortreux et al., 2018);(Ajibade et al., 2020);(de Salles Cavedon-Capdeville et al., 2020);(Margaret and Matias, 2020);(Alverio et al., 2021);(Stanley and Williamson, 2021);(See and Wilmsen, 2020); Alverio et al 2021) (Bronen and Chapin, 2013);(Göransson et al., 2021)		(Wrathall et al., 2019);(Weber, 2017);(Kälin, 2018);(Koubi et al., 2018);(Linke et al., 2018);(Warner, 2018);(Deshpande et al., 2019);(Honarmand Ebrahimi and Ossewaarde, 2019);(Adger et al., 2020b);(de Salles Cavedon-Capdeville et al., 2020);(Margaret and Matias, 2020);(Hauer et al., 2020);(Hughes, 2020);(Sedova and Kalkuhl, 2020);(Adger et al., 2021)
	Institutional capacity and administrative feasibility		(Gould and Rudolph, 2015);(Fox et al., 2019);(Lee et al., 2020);(Li et al., 2021); (Opoku et al., 2021); (Pascal et al., 2021), Reed, 2020 #13856}; (Marcus and Hanna, 2020);(Schramm et al., 2020); (Castleden et		(Singh et al., 2018);(Aleksandrova, 2020);(Bordon Rosa and Lykke Strøbech, 2020);(Bowen et al., 2020)		(Mortreux et al., 2018);(Ajibade et al., 2020);(de Salles Cavedon-Capdeville et al., 2020);(Alverio et al., 2021); (Mach and Siders, 2021);(Siders, 2019) ;(Watts et al.,		(Kälin, 2018);(Koubi et al., 2018);(Linke et al., 2018);(Warner, 2018);(Sedova and Kalkuhl, 2020);(Deshpande et al., 2019);(Honarmand Ebrahimi and Ossewaarde, 2019);(Kel

		🟦	al., 2020);(Christopher Boyer, 2020);(Kaufman et al., 2020);(Sheehan and Fox, 2020);(Kim et al., 2021);(Whitney et al 2021);(Kingsley et al., 2021);(Maria et al., 2020);(Zhang et al., 2020);(Iqbal, 2021);(Brooke-Sumner et al., 2019);(Berry et al., 2018);(Albright et al., 2020);(Negev et al., 2020);(Austin et al., 2019);(Gilfillan, 2019); (Haines and Ebi, 2019);(Hussey and Arku, 2020);(Lowe et al., 2020);(Negev et al., 2019);(Sheehan and Fox, 2020);(Sheehan et al., 2021);(Pelling et al., 2021)	🟦		🟦	2021);(Gussmann and Hinkel, 2020);(Albert et al., 2018) (See and Wilmsen, 2020);(Bronen and Chapin, 2013);(Boston et al., 2021);(Lawrence et al., 2020)	🟦	man et al., 2019);(Oakes, 2019b);(Piguet, 2019);(Wrathall et al., 2019);(Adger et al., 2020b);(Ajibade et al., 2020);(de Salles Cavedon-Capdeville et al., 2020);(Hauer et al., 2020);(Maharjan et al., 2020a);(Hughes, 2020);(Desai et al., 2021);(Bettini and Gioli, 2016)
	Transparency and accountability potential	🟦	(Gostin and Friedman, 2017);(Huynh and Stringer, 2018);(Parry et al., 2019)	🟦	(Hansen et al., 2019)	L E	(Doelle and Seck, 2020);(See and Wilmsen, 2020);(Siders and Ajibade, 2021)	L E	(Hauer et al., 2020);(Doelle and Seck, 2020);
Socio-cultural	Social co-benefits (health, education)	🟦	(Gould and Rudolph, 2015);(Rudolph et al., 2020);(Kligler et al., 2021);(Keim et al., 2021);(Kim et al., 2021);(Lowe	🟦	(Castells-Quintana et al., 2018);(Ulrichs et al., 2019);(Fischer, 2020);(Mueller et al., 2020)	🟦	(Hanefeld et al., 2018a);(Aktürk and Lerski, 2021);(Lauer et al., 2021b);(Yates et al., 2021);(Piggott-McKellar	🟦	(Islam and Shamsuddoha, 2017);(Hanefeld et al., 2018a);(Schwerdtle et al., 2018);(Jacobson et al., 2019);(Pigu

		■	et al., 2020);(Pelling et al., 2021)	■		░	et al., 2019a);(Henrique and Tschakert);(Ajibade et al., 2020);(Wilmsen and Webber, 2015) ;(Dannenberg et al., 2019);{Ajibade, 2020; {Desai, 2021 #5248};(Tabe, 2019);(Bronen and Chapin, 2013);(See and Wilmsen, 2020) (Dundon and Abkowitz, 2021)	▨	et, 2019);(Kaczan and Orgill-Meyer, 2020);(Hoffmann et al., 2020);(Oakes, 2019a);(Schwerdtle et al., 2020) ;(Yates et al., 2021);(Desai et al., 2021);
	Socio-cultural acceptability	▨	(Gould and Rudolph, 2015);(Fox et al., 2019);(Gilfillan, 2019);(Hayes et al., 2020); (Keim et al., 2021); (Kingsley et al., 2021); (Méndez et al., 2020); (Sheehan and Fox, 2020);(Wong-Parodi, 2020); (Arnold et al., 2021); (Pascal et al., 2021)	LE		░	(Zickgraf, 2019); (Farbotko, 2018);(Suliman et al., 2019);(Ayeb-Karlsson et al., 2018);(Piggott-McKellar et al., 2019a);(Dandy et al., 2019);(Geekiyanage et al., 2021);(Stanley and Williamson, 2021);(Van Praag, 2021);(See and Wilmsen, 2020)	░	(Koubi et al., 2018);(Linke et al., 2018);(Telford, 2018);(Hauer et al., 2020);(Zickgraf, 2019); (Farbotko, 2018);(Dandy et al., 2019);(Deshpande et al., 2019);(Suliman et al., 2019);(Ayeb-Karlsson et al., 2018);(Adams and Kay, 2019b);(Thober et al., 2018);(Kelman et al., 2019);;(Van Praag, 2021); (McLeman, 2019); (Wiegel et al., 2019) Adger et al 2021);(Mari

									no and Lazrus, 2015)
	Social and regional inclusiveness		(Chersich and Wright, 2019);(Fox et al., 2019);(Negev et al., 2019);(Lewis et al., 2020); (Asaaga et al., 2021); (Hayes et al., 2020); (Johnson, 2020);Schwerdtle, 2020 #1949};(Rohat et al., 2021); (Keim et al., 2021), (Paudel and Pant, 2020); (Whitney et al., 2020);(Kingsley et al., 2021); (Méndez et al., 2020); (Murray and Poland, 2020)	L E	(Coirolo et al., 2013);(Singh et al., 2018);(Aleksandrova, 2020);(Bordon Rosa and Lykke Strøbech, 2020)		(Zickgraf, 2019);(Doelle and Seck, 2020);(Kupferberg, 2021);(Ajibade, 2019);(Piggott-McKellar et al., 2019a);(Henrique and Tschakert);(Ajibade et al., 2020);(Wilmsen and Webber, 2015; Dannenberg et al., 2019);(Henrique and Tschakert, 2020); (Desai et al., 2021);(Tabe, 2019);(See and Wilmsen, 2020) (Alverio et al 2021);(Bronen and Chapin, 2013); (See and Wilmsen, 2020);(Forsyth and Peiser, 2021)		(Mallick et al., 2017);(Suckall et al., 2017);(Jessoe et al., 2018);(Kälin, 2018);(Koubi et al., 2018);(Linke et al., 2018);(Warner, 2018);(Adams and Kay, 2019b);(Cattaneo et al., 2019);(Deshpande et al., 2019);(Jacobson et al., 2019);(Natarajan et al., 2019);(Zickgraf, 2019);(Hauer et al., 2020);(Hoffmann et al., 2020);(Doelle and Seck, 2020);(Adger et al., 2021); (Nawrotzki and DeWaard, 2018)
	Gender equity	L E	(Lee et al., 2020);(Eriksen et al., 2021)		(Bee et al., 2013);(Coirolo et al., 2013);(Mesquita and Bursztyn, 2017);(Mersha and van Laerhoven, 2018);(Centre, 2019);(Bowen et al.,	L E	(Bronen and Chapin, 2013);(See and Wilmsen, 2020);(Alverio et al., 2021)		(Mitra, 2018);(Thober et al., 2018);(Banerjee et al., 2019);(Gioli and Milan, 2019);(Jacobson et al., 2019);(Oakes, 2019b);(Piguet,

					2020);(Su et al., 2020);				2019);(Singh, 2019);(Lama et al., 2020);(Sedova and Kalkuhl, 2020);(Singh et al., 2020b);(Desai et al., 2021)
	Intergenerational equity	LE	(Ziba, 2018);(Slobodian, 2020);(Fiack et al., 2021);	LE	(Coirolo et al., 2013);(Bowen et al., 2020);(Tenzing, 2020);		(Schwartz et al., 2021);(Piggott-McKellar et al., 2019a);(Boston et al., 2021)		(Wrathall, 2012);(Schwartz et al., 2021);
Environmental/ ecological	Ecological capacity	NA		NA			(Yeboah et al., 2020) ;(See and Wilmsen, 2020)		(Singh et al., 2020c);(Singh et al., 2020a);(Wrathall, 2012)
	Adaptive capacity/ resilience		(Christopher Boyer, 2020);(Chersich and Wright, 2019); (Haines and Ebi, 2019); (Nuzzo et al., 2019);(Rudolph et al., 2020); (Hanefeld et al., 2018b); (Linares et al., 2020)		(Castells-Quintana et al., 2018);(Hansen et al., 2019);(Centre, 2019);(Ulrichs et al., 2019);(Fischer, 2020);(Mueller et al., 2020);(Tenzing, 2020);		(Tebboth et al., 2019); (Watts et al., 2021);(Liu et al., 2020);(See and Wilmsen, 2020);		(Wrathall, 2012);(Islam and Shamsuddoha, 2017);(Nawrotzki and Bakhtsiyarava, 2017);(Kälin, 2018);(Warner, 2018);(Adams and Kay, 2019b);(Banerjee et al., 2019);(Sedova and Kalkuhl, 2020);(Singh, 2019);(Hoffmann et al., 2020);(Jacobson et al., 2019);(Kaczan and Orgill-Meyer, 2020);(Maharjan et al., 2020a); (Singh et

		🟦		🟦		🟦		🟦	al., 2020b);(McLeman, 2018);(Adams and Kay, 2019a); (Semenza and Ebi, 2019);(Bettini and Gioli, 2016)
Geophysical	Physical feasibility	NA		NA		🟦	(Dandy et al., 2019);(McNamara, 2015; Mortreux et al., 2018);(Albert et al., 2018);(Lauer et al., 2021a)	🟦	(Adams and Kay, 2019b); (Adger et al., 2020a);(Cattaneo et al., 2019)
	Land use change enhancement potential	NA		NA		NA		NA	
	Hazard risk reduction potential	NA		🟦	(Ulrichs et al., 2019);(Tenzing, 2020);(Fischer, 2020);(Mueller et al., 2020)	🟦	(Greiving et al., 2018);(Hughes, 2020);(Jain and Bazaz, 2020)	🟦	(Islam and Shamsuddoha, 2017);(Adams and Kay, 2019b);(Jacobson et al., 2019);(Semenza and Ebi, 2019);(Hoffmann et al., 2020);(Hughes, 2020);(Kaczan and Orgill-Meyer, 2020);(Singh et al., 2020b);(Singh and Basu, 2020);(McLeman, 2018)

SMCCB FEASIB.2 Adaptation and Mitigation Synergies and Trade-offs as Discussed in Section CCB FEASIB.4

SMCCB FEASIB.2.1 Adaptation Options with Mitigation Synergies and Trade-offs

Table SMCCB FEASIB.8: Synergies and trade-offs of adaptation options with mitigation. The strength (strong, medium, weak) of the synergy or trade-off is indicated in square brackets at the beginning of each statement, together with its confidence level.

Systems transitions	**Adaptation option**	**Implications for mitigation**	
		Synergies	**Trade-offs**
Energy system transitions	Resilient power infrastructures	***(strong, high confidence)*** Strong synergies with mitigation goals as resilient infrastructure allows power generation systems to continue operations without disruptions (or minimal disruptions). This is especially important for renewable energy systems (Kennedy et al., 2013; O'Neill-Carrillo and Rivera-QuiÑones, 2018). ***(strong, high confidence)*** In rural landscapes, resilient power infrastructure ensures electricity availability during emergencies and protects the communities from any malfunction of the infrastructure itself. (Ley, 2017; Bertheau and Blechinger, 2018; Mazur et al., 2019)	
	Reliable power systems	***(strong, high confidence)*** Strong synergies with mitigation goals as reliable systems decrease the risk of disruptions and avoid the use of fossil fuels, in the cases where the main energy system is renewable energy, either centralised or decentralised (Ley, 2017; Sun et al., 2018; Lai et al., 2019; Mishra et al., 2020)	
	Improve water use efficiency	***(medium synergy, high confidence)*** Improved water use efficiency increases generation efficiency in certain natural gas combined cycle plants (Pan et al., 2018), while at the same time improving freshwater use and ensuring that water sources' ecological flows are not disturbed (Rasul and Sharma, 2016; Sánchez and Izzo, 2017; Stańczuk-Gałwiaczek et al., 2018). The improved water use efficiency, for example, in community micro-hydroelectric plants, allows for integrated water management across the watersheds that ensures water for irrigation, human consumption and other productive uses (Ley, 2017).	

Land and Ecosystem transitions	Sustainable aquaculture	***(strong, high confidence)*** Sustainable aquaculture can enhance carbon sequestration (Ahmed et al., 2018); (Otuoze et al., 2018; Turolla et al., 2020; Mustafa et al., 2021), and ecosystem restoration (Stentiford et al., 2020). ***(strong, high confidence)*** Reducing impacts of sustainable aquaculture can have important co-benefits such as maintaining large quantities of organic carbon (Ahmed et al., 2018, 'blue carbon'; see section 3.4.4.12 of IPCC SR1.5) carbon ('blue carbon'; see section 3.4.4.12 of IPCC SR1.5) from exposure to the atmosphere.	
	Integrated Coastal Zone Management	***(strong, high confidence)*** Implementation of nature-based solutions for coastal management can enhance and stabilize carbon sequestration capacity of the ecosystems (Propato et al., 2018; Morecroft et al., 2019; Morris et al., 2019; Donatti et al., 2020; Erftemeijer et al., 2020; Gómez Martín et al., 2020; Hanley et al., 2020; Jones et al., 2020; Krauss and Osland, 2020).	
	Coastal defence & hardening		***(medium, high confidence)*** Hard-engineering infrastructures can affect ecosystem function and services (Antunes do Carmo, 2018; Hamin et al., 2018) ***(weak, low confidence)*** Building and protecting hard-engineering infrastructures may affect the demand for basic materials (e.g., steel and cement), which are carbon-intensive (Hamin et al., 2018). We have not found any estimates of the potential demand (WGIII CH,11.4.4)
	Sustainable forest management and conservation, reforestation and afforestation	***(strong, high confidence)*** Forest-based adaptation strategies have positive impacts on mitigation, carbon sequestration, biodiversity and provision of wood for buildings and bioenergy (Nabuurs et al., 2017; Shrestha and Dhakal, 2019; Ontl et al., 2020). ***(strong, high confidence)*** Avoided deforestation, prevented forest	***(strong, medium confidence)*** Over reliance on forest-based adaptation strategies may lead to an increased susceptibility to other climate-related hazards, such as wildfires, which emit large amounts of carbon and other GHGs into the atmosphere (Nunes et al., 2020). ***(weak, medium confidence)*** Forest restoration initiatives that promote fast-

		degradation and pro-forestation strategies reduce emissions of carbon into the atmosphere, while forest restoration, afforestation options and locally adapted climate smart forestry (including provision of timber for building), remove carbon from the atmosphere (Nabuurs et al., 2017; Favero et al., 2020; Ontl et al., 2020; Ota et al., 2020) ***(strong, high confidence)*** These forest-based adaptation strategies have important climate change mitigation effects in all biomes (Chausson et al., 2020; Seddon et al., 2020a; Seddon et al., 2020b)	growing plantations of pulp and timber species such as *Pinus* and *Eucalyptus*, which are extremely flammable, exacerbate wildfire risk and ecosystem carbon loss, leading to increased GHG emissions (Fleischman et al., 2020). A proper management and choice of a variety of tree species can counteract this risk.
	Biodiversity management and ecosystem connectivity	***(strong, high confidence)*** Adaptation options incorporating a biodiversity management-based approach, can positively impact forests' resilience and their long-term capacity as carbon sinks (Seddon et al., 2019; Chausson et al., 2020; Seddon et al., 2020a; Seddon et al., 2020b)	***(strong, medium confidence)*** Without adequate and locally adapted measures, including a biodiversity management-based approach, vegetation-based adaptation alternatives might result in mal-mitigation (Yousefpour et al., 2017)
	Improved cropland management	***(medium, medium confidence)*** Improved cropland management practices and technologies (e.g. tillage methods, water application, nutrient management) reduce GHG emissions significantly but depend on technology type and the stage of its adoption, e.g., direct rice seeding can reduce methane emissions while laser land levelling can reduce energy used for irrigation (Aryal et al., 2020, in South Asia). ***(strong, medium confidence)*** Combinations of improved cropland practices like reduced or no-tillage, nutrient management, and residue recycling have a higher rate of soil organic carbon sequestration of 427.9 kg/ha/yr under rice-rice system (Yadav et al., 2019, in North East India) while optimised nutrient management through organic farmyard manure and other micronutrients increases soil organic carbon in maize-mustard cropping systems by up to 9.7% (Sarkar et al., 2018, in North East India).	***(weak, medium confidence)*** Improved cropland management practices aimed at increasing carbon sequestration in agriculture soils could lead to increased greenhouse gas emissions if the nitrogen inputs are not managed effectively. By 2060, around half of sites in Europe with carbon-mitigating agricultural practices could turn into a net source of greenhouse gases (Lugato et al., 2018). ***(weak, low confidence)*** The increase in soil organic carbon through climate-smart agriculture practices could be offset by increased nitrous oxide emissions within corn belt states in the US (McNunn et al., 2020).

		(strong, medium confidence) Improved soil management practices increase soil organic carbon stocks, e.g. in the North China Plain, such practices have increased SOC by 56-73% compared to initial stocks in the 1980s. Implementation of such practices in just 27% of China's cropland increased annual carbon sequestration amount in surface soils to 10.9 Tg C/year, contributing an estimated 43% of total carbon sequestration in China's croplands (Han et al., 2018). ***(medium, medium confidence)*** Emerging cropland management practices like minimal tillage, stubble retaining and nutrient management increase soil organic carbon stocks but the extent varies with site-specific conditions (Singh et al., 2018, global review). ***(strong, medium confidence)*** Integrated soil-crop system management can reduce GHG emissions by 19% and carbon footprint by 30% compared to traditional practices (Wang et al., 2020, Yangtze river basin, China). ***(strong, high confidence)*** Integrated soil-fertility management and conservation agriculture contribute to climate change mitigation by reducing SOC losses (Sommer et al., 2018, in Western Kenya; Shah and Wu, 2019, global review). ***(strong, medium confidence)*** Conservation agriculture has an estimated annual carbon sequestration benefit of 143 Tg C per year (Gonzalez-Sanchez et al., 2019, in Africa).	
	Efficient livestock systems	***(strong, medium confidence)*** Improving efficiency of livestock systems through practices such as integrated crop-livestock systems, shifting species and/or breeds, livestock corralling, changed grazeland management practices, can have	***(medium, medium confidence)*** Over intensified grasslands can cause excessive greenhouse gas emissions and ammonia production, negating the positive effect from grassland carbon sequestration (Accatino et al., 2019) but this depends on grassland

		significant mitigation co-benefits (Rivera-Ferre et al., 2016). ***(strong, medium confidence)*** Improving animal feeding and genetics can be effective mitigation measures (Rojas-Downing et al., 2017) ***(strong, medium confidence)*** Producing and feeding improved forage (most suited to intensive and semi-intensive dairy farms, and mixed systems) can reduce emission intensities by 8-24% in Kenya, and up to 27% on mixed systems in Ethiopia (Ericksen and Crane, 2018).	management practices and local ecosystem characteristics (Rojas-Downing et al., 2017)
	Agroforestry	***(strong, high confidence)*** Agroforestry is generally found to have positive impacts on mitigation by improving carbon sequestration (Tschora and Cherubini, 2020).	***(weak, medium confidence)*** Thinning of natural forest canopy to establish agricultural crops such as cocoa or coffee seedlings retains more trees than in a monoculture plantation, but carbon stocks are diminished (Tschora and Cherubini, 2020). In addition, over reliance on vegetation-based adaptation strategies may lead to an increased susceptibility to wildfires, which release large amounts of carbon into the atmosphere (Nunes et al., 2020).
	Water use efficiency and water resource management	***(medium, medium confidence)*** Water-saving irrigation practices such as alternate wetting and drying and soil water potential (SWP) have mitigation co-benefits through CH4 and NO2 emissions reductions. SWP also significantly reduced seasonal methane emissions by ~30% when combined with better fertiliser application (Islam et al., 2020). ***(medium, medium confidence)*** Integrated watershed management sequesters carbon by enhancing soil carbon storage through better yields and residue returns (Sikka et al., 2018). ***(strong, medium confidence)*** Drip irrigation can reduce cumulative CH4 flux by 194% in a year when compared to conventional flooding in rice cultivation (Fawibe et al. 2019, in Japan); increase 22% CH4 uptake and reduce N2O emissions by 14.6% (Wang et al. 2016, in rice in China); while micro-irrigation save energy use	***(weak, medium confidence)*** Some water use efficiency practices can increase water use and hence energy demand (Song et al., 2018, in China; Berbel et al., 2018)

		by 58% compared to conventional gravity irrigation (Kumar and Perry, 2019).	
	Livelihood diversification	***(strong, high confidence)*** Sustainable livelihood diversification (promoted by local as well as global frameworks such as REDD+) that are equitable and pro-poor yield substantial co-benefits spanning adaptation, mitigation and sustainable development (e.g Coffee-Agroforestry systems in West Africa (Tschora and Cherubini, 2020, in India; Guillemot et al., 2018, mixed outcomes of forest carbon projects in India; Aggarwal and Brockington, 2020). ***(medium, high confidence)*** Sustained evaluation and orientation to reform are however needed to ensure equal distribution of carbon revenues in land-based sustainable livelihood diversification but also meet local livelihood needs and ensure pro-poor benefit sharing (Atela et al., 2015; Asfaw et al., 2019; Shrestha and Dhakal, 2019).	***(medium, medium confidence)*** However, not all livelihood diversification options are pro-climate, particularly precarious mass risk hedging strategies across the rural-urban continuum in informal economies of southern geographies (Satterthwaite et al., 2018). ***(weak, medium confidence)*** The extent of trade-offs with mitigation targets is understudied, however qualitatively the consensus is building around potential trade-offs between climate transitions, acute poverty and informal economy (Heine et al., 2019; Dorband et al., 2019)
Urban system transitions	Sustainable land-use & urban planning	***(strong, high confidence)*** Land-use and urban planning can be a tool for resilient cities, but also can lead to reduced emissions through incentivizing high density housing or investing in public transportation to replace private automobiles (Hughes, 2020) ***(strong, medium confidence)*** Climate-resilient urban buildings can also be built with low-carbon materials (Hughes, 2020)	***(weak, medium confidence)*** High density cities can lead to fewer carbon emissions, but risks concentrating people and infrastructure in exposed locations (Hinkel et al., 2018)
	Green infrastructure and ecosystem services	***(medium, high confidence)*** Urban forestry and agriculture has mitigation benefits through increased carbon uptake. E.g. in Lugo, Spain, urban forestry and farming collectively sequester 0.26 t C ha-1 per year (De la Sota et al., 2019) ***(strong, medium confidence)*** Urban agriculture can reduce energy-intensive food transportation, improve soil carbon sequestration capacity (if sustainable agricultural practices are used), and enable transitions towards	***(strong, medium confidence)*** The lack of consideration of the heat-water-vegetation nexus can increase heat and water stress (Afshari, 2017; Upreti et al., 2017; Zardo et al., 2017; Chen et al., 2019; Peng et al., 2020; Rahman et al., 2020) ***(weak, medium confidence)*** Mitigation policies towards urban greening can sometimes incentivize urban greening with low biodiversity value (e.g. afforestation with non-native

		low-carbon, plant-based diets (Artmann and Sartison, 2018; Grafakos et al., 2019). ***(weak, medium confidence)*** Green infrastructure options such as xeriscaping and water-sensitive urban design (permeable surfaces, bioswales, etc.) can sequester carbon and have cooling effects that indirectly lead to reduced energy consumption (Sharifi, 2021)	monocultures) leading to maladaptive outcomes (Seddon et al., 2020a).
	Sustainable water management, urban and infrastructure system transitions	***(weak, medium confidence)*** Reduction of energy and environmental implications of water supply methods (Ding and Ghosh, 2017; Liu and Jensen, 2018; Pérez-Uresti et al., 2019) ***(strong, medium confidence)*** Strong co-benefits of demand-side management measures, for example, reduced leakages and water loss (Arfanuzzaman and Atiq Rahman, 2017; Chen et al., 2017; Stavenhagen et al., 2018)	***(strong, medium confidence)*** Desalination has high energy demand with carbon emissions attached (Darre and Toor, 2018)
Overarching adaptation options	Disaster Risk Management	***(strong, medium confidence)*** Incorporating environmental considerations into recovery decision-making (Amin Hosseini et al., 2016), implementing disaster risk management plans and increasing ex-ante resilience to disasters are important to reduce the extent of rebuilding following disasters, and the emissions associated with recovery. ***(weak, medium confidence)*** Post-disaster recovery can help rebuild in a more resilient way with less GHG emissions, or to "build back better", particularly where immediate impact is substantial but not overwhelming (Guarnacci, 2012; Mochizuki and Chang, 2017). ***(weak, medium confidence)*** Effective disaster risk management may reduce the need for international transport of materials and other forms of aid, which can be emissions-intensive (Abrahams, 2014).	***(weak, medium confidence)*** The urgency of recovery and the surge in demand for construction materials have been observed to promote unsustainable behaviours, including deforestation (Nazara and Resosudarmo, 2007; Ongpeng et al., 2019) or uncontrolled extraction of sand and gravel (Abrahams, 2014). ***(strong, high confidence)*** 'Building back better' requires capacity, time, and mechanisms for balancing competing desires and perspectives that are not necessarily available after severe disasters, and may be challenged by both local and external influences in the rebuilding process (Abrahams, 2014; O'Hare et al., 2016; Paidakaki and Moulaert, 2017).

	Risk spreading and sharing	***(weak, medium confidence)*** Some insurance schemes adopted in the forestry and agricultural sector can lead to greater amount of biomass stored in soils and hence to an increased volume of carbon sequestered (Müller et al., 2017; Jørgensen et al., 2020; Loisel et al., 2020).	***(strong, medium confidence)*** Insurance policies sustain the re-construction and repair of damaged property and/or infrastructure and the return to the 'status quo', which may increase GHG emissions from the production of concrete and other needed materials of industrial origin (Cannon et al., 2020; Collier and Cox, 2021). ***(strong, high confidence)*** Access to crop and weather-indexed insurance schemes can drive farmers to adopt more intensive agricultural practices and increase agricultural productivity (Jørgensen et al., 2020), potentially increasing emissions related with the use of nitrogen fertilizers, lack of action to control ammonia , and potential land use changes (e.g. deforestation). Increased food production may also increase food imports and their related transport GHG emissions.
	Population health and health system	***(strong, high confidence)*** Heat management strategies, including tree planting and other green infrastructure, cool roofing and paving, and a reduction in waste heat emissions from buildings and vehicles can lessen the health risk of rising temperatures, as well as lessen greenhouse gas emissions (Stone et al., 2019). ***(strong, high confidence)*** Groundwater-source heat pumps (GWSHP) are considered environmentally friendly and economically wise to use for heating and cooling buildings, and consequently have great potential to moderate greenhouse gas emissions (Osman and Sevinc, 2019).	***(medium, medium confidence)*** Use of indoor air conditioning can be an effective strategy to reduce heat exposure, stress, and illness. However, this is associated with large energy consumption and may increase GHG emissions (Davide et al., 2019); Viguie et al 2020), in turn worsening air quality and human health impacts (Abel et al., 2018)
	Social safety nets	No new literature since SR1.5	
	Planned relocation and resettlement	Not applicable	Not applicable
	Human migration	Not applicable	Not applicable

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SMCCB FEASIB.2.2 Mitigation Options with Adaptation Synergies and Trade-offs

Table SMCCB FEASIB.9: Synergies and trade-offs of mitigation options with adaptation. The strength (strong, medium, weak) of the synergy or trade-off is indicated in square brackets at the beginning of each statement, together with its confidence level.

Systems transitions	**Mitigation options**	**Implications for adaptation**	
		Synergies	**Trade-offs**
Energy system transitions	Solar energy	***(strong, high confidence)*** Generates employment opportunities particularly during construction; reduced local pollution; clean energy access in rural areas (Joshi et al., 2019; Karlsson et al., 2020). ***(strong, high confidence)*** When produced on-site, solar power provides electricity supply in the case of grid failure due to natural disasters or very high temperatures shutting off large power stations overheating the transmission/distribution network. Solar technologies such as thermal and solar cooking can also contribute to on-site energy security (Fang and Wei, 2013; Wei et al., 2013). ***(strong, high confidence)*** Solar photovoltaic is a renewable energy source whose output is relatively robust to climate change (Yalew et al., 2020; Gernaat et al., 2021), therefore it reduces emissions while increasing energy security (Shen and Lior, 2016). ***(strong, high confidence)*** Solar can be complementary to other renewable energy sources, reducing system vulnerabilities (Beluco et al., 2012; Buttler et al., 2016; Kougias et al., 2016; Viviescas et al., 2019; Shen and Lior, 2016).	***(strong, medium confidence)*** Generation of e-waste; land requirement; competition with food production; vulnerability of local communities due to large scale plants, although the impact is highly location and context-specific (Stock et al., 2019).
	Wind energy	***(strong, high confidence)*** Wind can be complementary to other renewable energy sources, windmills over new forests are possible; reducing system vulnerabilities (Beluco et al., 2012; Buttler et al., 2016; Kougias et al., 2016; Viviescas et al., 2019).	
	Hydroelectric power	***(weak, medium confidence)*** Multiple uses for hydropower reservoirs can bring socioeconomic benefits and reduce flood risk (Xu et al., 2015). ***(strong, low confidence)*** Hydropower reservoir storage capacity can buffer changes in river flow, helping to manage	***(strong, high confidence)*** May cause loss of biodiversity; and adverse impacts on local communities and the environment. In the case of drought, there is not enough water to produce electricity or need to divert water for irrigation or human use (Oliveira et al., 2016).

		hydrological variability (Schaeffer et al., 2012). ***(strong, medium confidence)*** Hydropower can be complementary to other renewable energy sources, reducing system vulnerabilities (Beluco et al., 2012; Kougias et al., 2016; Viviescas et al., 2019)	***(strong, high confidence)*** At large-scale hydropower can result in land-use conflicts, and could lead to mal-adaptation ***(strong, medium confidence)*** Hydropower may be vulnerable to climate change impacts through changes in the hydrological cycle, increasing electric system vulnerability (Schaeffer et al., 2012; Lucena et al., 2018; Yalew et al., 2020)
	Nuclear	***(medium, high confidence)*** Increases energy security; provides direct non-CO2 emitting energy access (Prăvălie and Bandoc, 2018; Sovacool et al., 2020a)	***(strong, high confidence)*** Represents several risks to local communities, especially health, and the environment in the case of a disaster (Hatch et al., 2005; Grubler, 2010; Sovacool, 2010; Howard, 2014; McCurry, 2015; Ohtsuru et al., 2015; Wheatley et al., 2016b; Wheatley et al., 2016a; Gilbert et al., 2017; Portugal-Pereira et al., 2018; Sase et al., 2021), however, there is low trade-off and medium confidence of operation outside of normal operating conditions (Prăvălie and Bandoc, 2018) ***(weak, low confidence)*** LCOE are higher than VREs. Thermal inertia of NPP makes it challenging to complement VREs (Sovacool et al., 2020b)
	Carbon dioxide capture and storage (CCS)	***(weak, low confidence)*** Diversification of livelihood for people in areas of geological sequestration; potential for just transition away from high polluting industry jobs (Buck et al., 2020) ***(weak, low confidence)*** Training for workers currently engaged in fossil fuel extraction to create a community of practice on carbon management (Buck et al., 2020).	***(medium, low confidence)*** Even though large-scale deployment of CCS is not necessarily found to lead to higher long-term water consumption from fossil-fueled power generation compared to systems without CCS (e.g. Kyle et al., 2013), for coal-fired power plants located in water-scarce areas, the additional water consumption required by CCS could create competition with other human activities for local water resources (Merschmann et al., 2013; Rosa et al., 2020) potentially undermining local adaptation efforts.
	Bioenergy and BECCS	***(strong, medium confidence)*** Enhanced productivity when done properly as part of ongoing agriculture and forestry; enhanced waste recycling; enhanced income for farmers and forest owners when bioenergy is derived from residues and low quality wood; favors local employment; local energy that can compensate for fluctuations from wind	***(strong, high confidence)*** There are clear absolute limits to amounts of bioenergy feasible; if derived from very large (mal-designed) bioenergy plantations then many risks and trade offs occur with biodiversity pressure and loss, competition for food, food-water security risks, soil degradation

		and solar. Clear air quality improvement and reduced air pollution (Shyamsundar et al., 2019) and non-CO2 emissions (Garg et al., 2011), if counterfactual is to burn residues in the field. ***(weak, medium confidence)*** when designed properly, bioenergy plantations can serve as connectivity pathways between nature areas (WGIII CH12.5). ***(strong, medium confidence)*** Modern bioenergy provides clean energy access (WGIII CH12.5.2). ***(strong, medium confidence)*** Bioelectricity complements VREs and reservoir hydropower as a balancing power source thus helping to ensure grid stability and quality, and in situations where hydro is limited due to drought (Lehtveer and Fridahl, 2020) ***(strong, high confidence)*** Clear air quality improvement if counterfactual is to burn residues in the field (SDG 3) (Smith et al., 2019)	due to overuse of fertilizers (WGIII CH7.4.4; WGIII CH12.5). ***(strong, medium confidence)*** Poorly-sited energy crops can reduce water availability for agriculture and settlements (WGIII CH12.5.2)..
	Fossil fuels phase out	***(strong, high confidence)*** Produces benefits to the local environment and health co-benefits (Ambasta and Buonocore, 2018; Lelieveld et al., 2019; Rauner et al., 2020)	
	Energy storage for low-carbon grids	***(strong, high confidence)*** Increases energy security (Gür, 2018); produces employment opportunities (Ram et al., 2020)	***(weak, medium confidence)*** Generation of e-waste if recycling/circular economy not put into place (Gautam et al., 2021); impacts of mining of metals for battery components (Flexer et al., 2018) and unequal access to precious minerals (Prior et al., 2013; Watari, 2021)
	Demand side mitigation	***(strong, high confidence)*** Reduced energy costs; enhanced energy access (Aklin et al., 2018). ***(strong, high confidence)*** Less demand for energy, which can be supplied by emergency batteries, small generators or solar panel in case of grid failure (Sehar et al., 2016).	
	System integration	***(strong, high confidence)*** Clean, reliable, flexible and affordable energy system (Hanna et al., 2018; van der Roest et al., 2021)	***(limited evidence)*** Increase energy costs (Brown et al., 2018)

Land and Ecosystem transitions	Healthy balanced diets, rich in plant based food (less animal based); and reduced food waste	***(strong, high confidence)*** Reduces pressure on forests, protecting biodiversity; decreases production intensity and use of inputs; improves population health and enhances health benefits, prevents malnutrition by providing access to food (Bodirsky et al., 2020; WGIII CH12.4; WGIII CH7.4.5.1; WGIII CH7.4.5.2). ***(weak, low confidence)*** Reducing food waste may enhance access to food, reduce food prices and - if combined with measures to improve distributional inequity and counter rebound effects - lead to more equal access to food (WGIII CH7.4.5.1; WGIII CH7.4.5.2; WGIII CH12.4.4). ***(weak, high confidence)*** Reduction of food waste decreases use of inputs, pressure on (crop)land, and reduces food costs. Solutions such as smart packaging can reduce food waste avoiding potential food safety risks (WGIII CH7.4.5.1; WGIII CH 7.4.5.2; WGIII CH12.4.3.5}	***(strong, medium confidence)*** Mostly a measure for the affluent society; a possible decrease in the price might lead to a rebound effect; shift to unsustainable fisheries may occur; reduced farmers' incomes when transition is not done in the right manner or without support (WGIII CH7.4.5.1; WGIII CH7.4.5.2).
	Reduce overconsumption	***(weak, high confidence)*** Improved dietary health and other health benefits, can enhance food security and environmental protection (Bodirsky et al., 2020; WGIII CH12.4; WGIII CH7.4.5.1; WGIII CH7.4.5.2)	
	Reduce non-CO2 emissions from agriculture	***(medium, medium confidence)*** Can enhance production efficiency, nutrient recovery, reduce localised pollution (e.g. improve air quality, reduce (Smith et al., 2019, water eutrophication), improve animal welfare, enhance soil quality (e.g. increase soil organic matter content), enhance rural livelihoods and food security (e.g. Di and Cameron, 2016; Herrero et al., 2016; Mbow et al., 2019; Beauchemin et al., 2020; Smith et al., 2020; WGIII CH7.4.3)	***(medium, medium confidence)*** Measures may cause toxicity or animal welfare issues, be antagonistic regarding different pollutants (e.g. potentially reducing N_2O but increasing NH_3 emissions) causing localised environmental degradation, or indirectly drive increased reliance on external inputs or land use change (LUC) and associated ecological damage (e.g. from increased production of concentrates for livestock feed), all potentially impacting adaptation capacity (e.g. Beauchemin et al. 2020; Di and Cameron, 2016; Ackrill and Abdo, 2020; Ba et al., 2020; Brandt et al., 2020; Eckard and Clark, 2020; WGIII CH7.4.3).
	Reforestation and restoration of other ecosystems	***(strong, high confidence)*** Increased provision of ecosystem services and goods, such as improved regulation of microclimate, increased groundwater recharge and watershed protection, improved quality of air and water, reduced soil erosion, expansion of biomass coverage, and improved habitat for wildlife and biodiversity (Buotte et al., 2020)	***(weak, medium confidence)*** May increase susceptibility to other climate-related hazards, such as fire (Nunes et al., 2020). ***(strong, medium confidence)*** Forest restoration-based mitigation could reduce the availability of productive

		(weak, medium confidence) Poverty reduction, creation of rural jobs, diversification of farming income, increased access to financial resources and ecosystem services markets for farmers, increased supply of wood for buildings and bioenergy, increased supply of drinking water to urban centers, reduction of risks associated with natural disasters and extreme weather events such as floods and landslides (Nabuurs et al., 2017; Bustamante et al., 2019; Soto-Navarro et al., 2020; von Holle et al., 2020).	agricultural land with potentially significant social and environmental consequences, including potential conflicts over land for agriculture, and rights and access of local people to forest resources when restoration initiatives are not duly planned nor funding has been secured, in addition to loss of biodiversity and other ecosystem functions, such as diminished water runoff as a result of upstream reforestation, (Bustamante et al., 2019).
	Enhance carbon in agricultural systems	***(strong, high confidence)*** Can improve soil quality by enhancing soil structure or soil biodiversity, thereby improving nutrient status/cycling, water holding capacity (increasing resilience to drought), or drainage (reducing erosion and run-off risk), increase crop yields, enhance land use efficiency (e.g. from increased yields, multi-cropping, diverse crop rotations or inclusion of trees or woody shrubs) and food security (e.g. Mbow et al., 2014; Smith and Leiserowitz, 2014; Lal, 2015; Powlson et al., 2016; Lal et al., 2018; Mbow et al., 2019)	***(medium, high confidence)*** Increased nitrogen inputs may be required to increase organic matter inputs (potentially offsetting some benefits regarding sequestration or causing localised air and water pollution), the effectiveness of practices is highly context specific, certain practices (e.g., using cover crops) can have variable biophysical impacts, or may change local hydrology (e.g., agroforestry), while there are issues around saturation and permanence, as soil organic carbon gains can be easily reversed. (e.g. Hirsch et al., 2018; Smith et al., 2019; Smith et al., 2020; Sun et al., 2020)
	Protect and avoid conversion of forests and other ecosystems (e.g. peatlands or natural grasslands)	***(strong, high confidence)*** Increased provision of ecosystem services and goods, such as improved regulation of microclimate, increased groundwater recharge and watershed protection, improved quality of air and water, reduced soil erosion, expansion of biomass coverage, and improved habitat for wildlife and biodiversity (Buotte et al., 2020) ***(weak, medium confidence)*** when combined with sustainable management it may lead to poverty reduction, creation of rural jobs, diversification of farming income, increased access to financial resources and ecosystem services markets for farmers, increased supply of drinking water to urban centers, reduction of risks associated with natural disasters and extreme weather events such as floods and landslides (Bustamante et al., 2019;	***(weak, medium confidence)*** May increase susceptibility to other climate-related hazards, such as fire (Nunes et al., 2020). ***(strong, medium confidence)*** Favoring forests over productive uses of land may affect local and rural communities' livelihoods dependent on agriculture, including conflicts over access and rights to land (Ambrosino et al., 2020).

		Soto-Navarro et al., 2020; von Holle et al., 2020).	
	Sustainable management of forests and other ecosystems	***(strong, high confidence)*** Increased provision of ecosystem services and goods, such as improved regulation of microclimate, increased groundwater recharge and watershed protection, improved quality of air and water, reduced soil erosion, expansion of biomass coverage, and improved habitat for wildlife and biodiversity (Buotte et al., 2020) ***(weak, medium confidence)*** sustainable provision of wood resources for building and bioenergy, poverty reduction, creation of rural jobs, increased access to financial resources and ecosystem services, reduction of risks associated with natural disasters and extreme weather events such as floods and landslides (Bustamante et al., 2019; Soto-Navarro et al., 2020; von Holle et al., 2020).	***(weak, medium confidence)*** May increase susceptibility to other climate-related hazards, such as fire (Nunes et al., 2020). ***(strong, medium confidence)*** Favoring forests over productive uses of land may affect local and rural communities' livelihoods dependent on agriculture, including conflicts over access and rights to land (Ambrosino et al., 2020).
	Biomass crops for bioenergy, biochar and other bio-based products	***(strong, medium confidence)*** Enhanced income for farmers and forest owners (SDG1, 8) (Smith et al., 2019) ***(strong, medium confidence)*** Strategically-integrated energy crops can enhance landscape heterogeneity, produce wood for buildings and other applications,supporting biodiversity conservation, support bioeconomy, (SDG 15), and reduce risk of flooding, soil erosion and impacts of drought (WGIII CH12.5.2; Smith et al., 2019) ***(strong, high confidence)*** Strong synergy with SDG7 (produces energy) and also 12 if replacing fossil energy (WGIII CH7.4.4; Smith et al., 2019)	***(strong, medium confidence)*** Large-scale biomass plantations could impact conservation of biodiversity (SDG15), compete for land with food production (SDG2), and competefor water in dry areas or pollute water through heavy fertilizer use (SDG6, 3, 14) (WGIII CH12.5.2; WGIII CH7.4.4)
Urban system transitions	Envelope improvement	***(strong, high confidence)*** Enhanced insulation leading to thermal comfort improvement- enhanced resilience from extreme temperatures (Barbosa et al., 2015; Bhikhoo et al., 2017) ***(strong, high confidence)*** Observed impacts of greening of façade/envelope/ green roofs on water footprint of building; may also reduce the urban heat island effect (Razzaghmanesh et al., 2016; Castiglia Feitosa and Wilkinson, 2018)	***(medium, high confidence)*** In certain moderate to warm climates attention must be paid to increases in air tightness in buildings due to thermal insulation, which may cause building overheating, in particular in regions without air-conditioning (Dodoo and Gustavsson, 2016; Fosas et al., 2018; WGIII CH9.7). For the time being literature is divided. (Baniassadi and Sailor, 2018; Collins and Dempsey, 2019)

	Heating, ventilation and air conditioning (HVAC)	***(strong, high confidence)*** Passive cooling and energy efficient HVAC systems contribute to increased thermal comfort, reducing the cooling needs associated with higher temperatures (van Hooff et al., 2016; Andrić et al., 2019; Rosse Caldas et al., 2020; WGIII CH9 ;Triana et al., 2018)	***(medium, high confidence)*** Mechanical (compressors based air conditioning) may increase the outdoor air temperature and thus affect the population/household without air conditioning. Therefore passive / natural cooling is the preferable solution (Ohashi et al., 2007; Jin et al., 2020) ***(strong, high confidence)*** Space cooling can be an important determinant of peak demand in periods of extreme heat (International Energy Agency 2018). Warmer climates and higher frequency and intensity of heat waves can lead to higher loads (Dirks et al., 2015; Auffhammer et al., 2017), increasing the risk of grid failure and supply interruptions.
	Efficient appliances	***(strong, medium confidence)*** Efficient cooling and heating contribute to increased thermal comfort. Efficient domestic appliances (or off-grid appliances) use less energy and can be run on batteries during climate induced natural disasters such as storms, hurricanes, typhoons (de Almeida et al., 2020) ***(strong, high confidence)*** Increasing energy efficiency may reduce the amount of energy needed to fulfil higher space cooling needs under a warming climate (Davide et al., 2019; Bezerra et al., 2021)	N/A
	Change in construction methods and materials	***(medium, low confidence)*** Bio materials (e.g. bio-concrete) reduced emissions as well as cooling needs for ensuring thermal comfort - enhanced resilience from extreme temperatures (Rosse Caldas et al., 2020). ***(medium, medium confidence)*** One key feature that may reduce cooling needs is large thermal mass in buildings and increased natural ventilation, allowing for example nighttime cooling (Calcerano and Cecchini, 2015)	N/A
	Active and passive management and operation	***(strong, high confidence)*** Human behaviour and active energy management will reduce the energy demand and offer more flexibility to allow a higher usage of renewable energy sources. A propensity to moderate energy consumption will help in case of reduced energy supply or	N/A

		intermittent energy supply due to climate induced natural disaster (Alexander and Yacoumis, 2018; Pfeiffer et al., 2021)	
	Digitalization	***(weak, low confidence)*** Digitalisation in buildings, water, energy and transport systems will result in more efficiency and less GHG emissions hence less energy use in the case of disruption to the energy supply (Rudram et al., 2016; Balogun et al., 2020)	***(weak, low confidence)*** digitalisation could be vulnerable to climate induced hazard or cyber security attacks; if digital system fails no subsystems would work (Fekete and Rhyner, 2020)
	Flexible comfort requirements	***(strong, high confidence)*** Building occupants allowing for higher indoor temperatures in summer and cooler indoor temperatures in winter will reduce energy consumption and be more adapted to heating and cooling disruptions (Albatayneh et al., 2019; Ming et al., 2020).	***(weak, low confidence)*** Thermal comforts differ across genders, so thermal discomfort could potentially increase for women if their preferences are not incorporated into flexible comfort requirements (Jabeen, 2019; McCall et al., 2019)
	Circular and shared economy	***(strong, medium confidence)*** Shared economy would enable citizens and organizations to reduce building space and share space, for example common spaces in buildings for social activities or specific tasks or shared offices. This flexibility in space requirements could be used in case on natural disaster (Gullström et al., 2017).	N/A
	Renewable energy production	***(strong, high confidence)*** On-site RE production could help building resilience in face of extreme events leading to infrastructure and electricity grid disruption (Pagliaro, 2019; Mahzarnia et al., 2020)	***(weak, low confidence)*** Possible impact on hydro by drought or other climate induced disaster (van Vliet et al., 2016)
	Fuel efficiency in transport	***(weak, low confidence)*** Vehicles requiring less fuel per mileage would allow for transport of people or goods in the case of disruptions to the fuel distribution chain (Liimatainen et al., 2018)	N/A
	Electromobility	***(weak, low confidence)*** Makes vehicles and public transport independent of fuel distribution systems and may allow for vehicles to be charged with solar or renewable energies when available, in addition it reduces the urban heat island effect and air pollution? (Yamaguchi and Ihara, 2020)	**(weak, low confidence)** In the case of disruption of the electricity network and the lack of on-site renewable energies, it is easier to store energy in liquid fuels than in batteries (Liimatainen et al., 2018)
	Urban land use and spatial planning	***(strong, high confidence)*** Resilience towards extreme events. Avoiding buildings in areas at risk (for example from forest fires or flooding). Building	***(strong, high confidence)*** High density cities can concentrate people and infrastructure in exposed locations

		new developments in areas with water supply and good and redundant communication networks (Hughes, 2020). ***(strong, high confidence)*** High density cities reduce transportation and emissions from buildings (Hughes, 2020)	for example enhancing the heat islands effect (Hinkel et al., 2018).
	Response option: district heating and cooling network	***(weak, low confidence)*** Resilience to extreme temperature (Tremeac et al., 2012)	(***weak, low confidence)*** May be affected by natural disaster, on site heat/cold generation could be preferable (Tremeac et al., 2012)
	Urban nature-based solutions	***(strong, high confidence)*** Green and blue spaces can both aid decarbonization and alleviate urban heat island effects, as well as potentially reduce floods impacts from storms (Alves et al., 2019)	***(strong, high confidence)*** Urban nature can potentially be inequitably distributed across social and economic groups, resulting in increased vulnerability, usually for ethnic minorities and low-income groups (Amorim Maia et al., 2020; Venter et al., 2020)
	Waste prevention, minimization and management	***(strong, low confidence)*** Lead to health and environmental benefits. Free up land that can be used for greening the cities (Koop and van Leeuwen, 2017).	N/A
	Integrating sector, strategies and innovations	***(weak, low confidence)*** Integration can both result in synergies and tradeoffs for the various sectors, strategies, and innovations (Uittenbroek et al., 2013)	N/A
Industrial system transitions	Industrial energy efficiency	***(weak, medium confidence)*** Energy efficiency reduces the pressure on energy supplies and if combined with demand flexibility increases resilience of industrial production and the electricity system (WGIII CH11.3.4 and 11.3.5). ***(strong, high confidence)*** Reduced energy demand, cost of production; enhances resource conservation (Goldman et al., 2012)	***(limited evidence)***There is no evidence of trade-offs between industrial energy efficiency and adaptation but some evidence of mainly positive co-benefits with SDGs (WGIII CH11.5.3.3)
	Materials efficiency and demand management	***(weak, low confidence)*** Reduced demand for basic materials (e.g., cement, steel, wood) means less pressure on primary resources and may in that way have synergies with adaptation but we have no evidence of a clear link.There are mainly co-benefits with other SDGs (WGIII CH11.5.3.1)	NE

	Circular economy	***(limited evidence)*** Improved circularity means less pressure on primary resources and may in that way have synergies with adaptation but we have no evidence of a clear link.There are mainly co-benefits with other SDGs (WGIII CH11.5.3.2)	***(limited evidence)*** There are no obvious trade-offs with adaptation and we have found no evidence of such (WGIII CH11.4.4 and 11.5.3.2)
	Electrification and fuel switching	***(weak, high confidence)*** Electrification is a key option to decarbonise primary materials production and it can be done in ways so that demand is flexible (e.g., with electrolysis and hydrogen storage) and thus support the balancing of electricity grids (WGIII CH11.3.5)	***(limited evidence)*** We have found no clear trade-offs with adaptation but some SDG co-benefits (WGIII CH11.5.3.4)
	Carbon dioxide capture and utilization (CCU)	***(weak, medium confidence)*** A key strategy to avoid GHG emissions throughout the lifecycle of chemicals is to use biomass feedstock, including CCU with biogenic carbon dioxide (WGIII CH11.4.1.3). If used to produce synthetic hydrocarbons and alcohols these can be used by existing long lived energy and feedstock infrastructure, transport and storage, which can compensate for seasonal supply fluctuations and contribute to enhancing energy security (WGIII CH11.3.6) ***(weak, low confidence)*** CCU pathways can offer entry points for local diversification, see also CCS and EW (Buck et al., 2020).	***(medium, medium confidence)*** Some CCU pathways are subject to the same tradeoffs as assessed for *Biomass crops for bioenergy, biochar and other bio-based products* above under **Land and ecosystems transitions** to the degree they use biomass as feedstock. ***(strong, medium confidence)*** Many CCU pathways consume considerable amounts of energy (Hepburn et al., 2019), potentially increasing the vulnerability of energy supply (indicating also a potential trade-off with SDG7). ***(medium, low confidence)*** CCU pathways involving CCS feature the same trade-offs with respect to water impacts of the capture process as outlined above (Merschmann et al., 2013; Rosa et al., 2020) - indicating medium trade-offs also for SDGs 4, 6 and 15.
	Industrial CCS	The same assessment as for *Energy CCS* and *Bioenergy and BECCS* under **Energy system transitions** applies.	The same assessment as for *Energy CCS* and *Bioenergy and BECCS* under **Energy system transitions** applies.
Cross-sectoral	Direct air carbon capture and storage (DACCS)		***(strong, high confidence)*** High energy needs can be at odds with energy security and thus also SDG7 (WGIII CH12.3.1.1; de Coninck et al., 2018) ***(medium, medium evidence)*** Liquid solution technologies require a significant amount of water (WGIII CH12.3.1.1; Fasihi et al., 2019) creating potential trade-offs with

			adaptation in dry areas, though under certain conditions water could also be produced (Fasihi et al., 2019).
	Enhanced weathering (EW)	***(strong, low evidence)*** Enhanced agricultural yields through EW treatment, raising adaptive capacity in food provision (Smith et al., 2019; Beerling et al., 2018). ***(weak, low evidence)*** Diversification of livelihood for communities with potential for mining minerals (Buck et al., 2020) ***(limited evidence)*** Training to improve soil health with amendments (excluding use of minerals with risk of heavy metal release, e.g. Hartmann et al. 2013), integrated into soil health assistance (Buck et al., 2020) ***(limited evidence)*** Tracking application of crushed basalt to agricultural land combined with advice on yield optimisation under climate change (Buck et al., 2020).	***(limited evidence)*** Entrenching social inequalities in mining communities (Buck et al., 2020) ***(limited evidence)*** Control by mining corporations with low social license, limiting participation (Buck et al., 2020) ***(medium, medium confidence)*** Ecological tradeoffs associated with mining and transport of minerals (Smith et al. 2019) that may negatively impact adaptive capacity, which may be significantly reduced by using excess industrial silicate materials instead of expanding mining (Beerling et al., 2020).

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