Supplementary Material 4.A

Table 4.A Feasibility assessment of overarching adaptation options

Option	Feasibility	Enabling Conditions	Constraints	Examples
Disaster risk management (DRM)	High agreement that maximising synergies between DRM and adaptation can reduce vulnerability Medium evidence on feasibility	Pools resources and expertise for risk reduction (Howes et al., 2015; Kelman et al., 2015; Wallace, 2017) Integrates adaptation into existing management (Howes et al., 2015) Supports post-disaster recovery and reconstruction (Kelman et al., 2015; Kull et al., 2016) Engagement of local and Indigenous knowledge can improve preparedness and response (Chambers et al., 2017; Granderson, 2017; Kaya et al., 2016; Mawere and Mubaya, 2015; McNamara and Prasad, 2014)	Uncertainty over projected climate impacts, absence of downscaled climate projections (de Leon and Pittock, 2017; van der Keur et al., 2016; Wallace, 2017) Limited institutional, technical, and financial capacity in frontline agencies (de Leon and Pittock, 2017; Kita, 2017; Muñoz et al., 2016; Wallace, 2017) Adaptation and DRM communities operate separately (de Leon and Pittock, 2017; Kelman et al., 2015; Serrao-Neumann et al., 2015)	*Glacial lake outburst floods (GLOFs)* 1.5°C will increase risk of GLOFs (Cogley, 2017; Kraaijenbrink et al., 2017). Infrastructural measures technically and economically unfeasible in many regions (Haeberli et al., 2017; Muñoz et al., 2016; Schwanghart et al., 2016; Watanabe et al., 2016) Early warning systems (Anacona et al., 2015), and monitoring of dangerous lakes and surrounding slopes offer DRM opportunities (Emmer et al., 2016; Milner et al., 2017) Institutional leadership and community engagement essential for effectiveness (Anacona et al., 2015; Watanabe et al., 2016)
Education and learning	High agreement that education and learning can reduce vulnerability Medium evidence on feasibility	Coproduction of solutions strengthens adaptation implementation (Butler et al., 2016; Ford et al.; Thi Hong Phuong et al., 2017) Social learning strengthens adaptation and affects longer-term change (Clemens et al., 2015; Ensor and Harvey, 2015; Henly-Shepard et al., 2015) International learning and cooperation mechanisms, supranational organizations (Vinke-de Kruijf and Pahl-Wostl, 2016), and international, collaborative projects	Not appropriate in all circumstances (e.g. highly marginalized locations) (Ford et al., 2016) Education and learning on their own may not provide "enough adaptive capacity to respond to climate change" (Thi Hong Phuong et al., 2017) Participation in and of itself does not necessarily build capacity (Ford et al., 2016)	*Participatory scenario planning (PSP)* PSP is a process by which multiple stakeholders work together to envision future scenarios under a range of climatic conditions. PSP has been observed to facilitate the interaction of multiple knowledge systems, resulting in learning and the co-production of knowledge on adaptation (Flynn et al., 2018; Oteros-Rozas et al., 2015; Star et al., 2016; Tschakert et al., 2014).

		(Cochrane et al., 2017; Harvey et al., 2017) can build adaptive capacity		
Financial options	*Insurance* Medium agreement that insurance can reduce vulnerability Medium evidence on feasibility	Buffers climate risk (Glaas et al., 2017; Jenkins et al., 2017; O'Hare et al., 2016; Patel et al., 2017; Wolfrom and Yokoi-Arai, 2015). Shifts the mobilization of financial resources towards strategic approaches (Surminski et al., 2016) Incentivize investments and behavior that reduce exposure (Jenkins et al., 2017; Linnerooth-Bayer and Hochrainer-Stigler, 2015; Shapiro, 2016).	Can provide disincentives for reducing risk and can distort incentives for adaptation strategies (Annan and Schlenker, 2015; Nicola, 2015) Underwrites a return to the 'status-quo' rather than enabling adaptive behavior (O'Hare et al., 2016) Financial, social, and institutional barriers to implementation and uptake, especially in low income nations (García Romero and Molina, 2015; Jin et al., 2016; Joyette et al., 2015; Lashley and Warner, 2015)	*Crop insurance* In Kenya during the 2011 drought, index-based insurance payouts for livestock reduced distress sales by 64% among better-off pastoralist households and reduced the likelihood of rationing food intake by 43% among poorer households (Hansen et al., 2017) In USA, (Annan and Schlenker, 2015) found insured crops were significantly more sensitive to extreme heat because insured farmers were disincentivised from investing in costly adaptation strategies since their insurance compensated any potential losses In Bangladesh low institutional trust and financial literacy means that fewer women enrol in weather-based crop insurance (Akter et al., 2016)
Financial options	*Catastrophe bonds* Limited evidence on feasibility	Spur risk reduction efforts as bonds become more valuable if the probability of a triggering event is reduced (Linnerooth-Bayer and Hochrainer-Stigler, 2015)	Requires adequate data collection to inform risk profile of bond (Joyette et al., 2015). Increasing frequency of "catastrophic" events will require increase in triggering threshold Pricing based only on exogenous risks (e.g. wind speed, rainfall) (Talbot and Barder, 2016)	*World Bank Cat bond issuance in Caribbean* In 2007, the Caribbean Catastrophe Risk Insurance Facility formed to pool risk from tropical cyclones, earthquakes, and excess rainfalls (CCRIF, 2017; Murphy et al., 2012) 36 payouts have been made to 13 governments, totalling USD$130.5 million, within 14 days of the event (CCRIF, 2017). Speed of payment allows countries to finance immediate needs(Murphy et al., 2012). Though widely perceived to be successful, evidence of success remains limited (Teh, 2015)
Financial options	*Social protection*	Builds generic adaptive capacity and reduce social vulnerability (Eakin et al., 2014;	Inadequate targeting, leakages, and lack of institutional architecture,	*Cash transfer programmes*

	High agreement that social protection can reduce vulnerability Medium evidence on feasibility	Lemos et al., 2016; Schwan and Yu, 2017; Weldegebriel and Prowse, 2013). Must be complemented with a comprehensive climate risk management approach (Schwan and Yu, 2017) that also takes into account disaster risk management, adaptation, and vulnerability reduction goals (Davies et al., 2013)	especially in LDCs (Ravi and Engler, 2015; Schwan and Yu, 2017) Uncertainties about effectiveness of processes of delivering social protection (e.g. cash or "in-kind"). Necessary but insufficient to decrease households' vulnerability if standalone (Lemos et al., 2016) When delivered without emphasis on vulnerability reduction, investments may be maladaptive in long run (Nelson et al., 2016)	In sub-Saharan Africa, cash transfer programmes targeting poor communities have proven successful in smoothing household welfare and food security during droughts, strengthening community ties, and reducing debt levels (Asfaw et al., 2017; Asfaw and Davis, 2018; del Ninno et al., 2016). In Brazil, higher levels of income due to cash transfer programs have been linked to food security, as households are able to invest in irrigation, but there have been limited long-term investments in reducing vulnerability among the poorest households (Lemos et al., 2016; Mesquita and Bursztyn, 2016; Nelson et al., 2016).
Health services	High agreement that when combined with iterative management can facilitate effective adaptation Medium evidence of feasibility	1.5C will primarily exacerbate existing health challenges (Smith et al., 2014), which can be targeted by enhancing health services Can be mainstreamed into existing health services (WHO, 2015) Needs to be combined with iterative management involving regular monitoring of effectiveness in-light of climate impacts (Ebi and del Barrio, 2017; Hess and Ebi, 2016a) Collaboration with local stakeholders, public education campaigns, and the tailoring of communication to local needs are essential (Berry and Richardson, 2016; van Loenhout et al., 2016).	Governance challenges: e.g. absence of coordination across scales, lack of mandate for action on adaptation (Baker-Austin et al., 2016; Kristie and del Barrio, 2017; Magnan et al., 2016; Shimamoto and McCormick, 2017) Absence of information and understanding on climate impacts (Nigatu et al., 2014; Sheehan et al., 2017; Xiao et al., 2016). Many health services currently don't consider climate change (Hess and Ebi, 2016b).	*Heat-wave early warning and response systems* Heat wave early warning and response systems coordinate the implementation of multiple measures in response to predicted extreme temperatures (e.g. public announcements, opening public cooling shelters, distributing information on heat stress symptoms) and have been shown to be effective in a wide variety of contexts (Knowlton et al., 2014; Nitschke et al., 2016, 2017; Takahashi et al., 2015).
Human migration	Growing evidence with low agreement	Revising and adopting migration issues in national DRR policies, NAPs, and INDCs/NDCs (Kuruppu and Willie, 2015; Yamamoto et al., 2017),	Research conducted on a "case by case" approach fails to provide the effective scaling of policy to national or international levels (Gemenne and	*Autonomous and planned relocation in SIDS and semi-arid regions*

	Low feasibility in many contexts	Utilizing existing social protection programmes to manage climate-induced migration (Schwan and Yu, 2017), Moving away from ad hoc approaches to migration and displacement (Thomas and Benjamin, 2017). Migration can serve as an important risk management strategy, leading to increased incomes (Cattaneo and Peri, 2016). Migration might become the only feasible adaptation option in highly vulnerable areas (Betzold, 2015; Wilkinson et al., 2016)	Blocher, 2017; Grecequet et al., 2017). Few policies on migration exist at the national or sub-national scales (Yamamoto et al., 2017) Financial, social and ecological costs (Grecequet et al., 2017) Stress on urban system resources and services (Bhagat, 2017) Migrants at risk of insecure tenure, unsafe living conditions, and exclusion in their destinations (Bettini et al., 2016; Bhagat, 2017; Gioli et al., 2016; Schwan and Yu, 2017)	Currently, migration is improving access to financial and social capital and reducing risk exposure (e.g. in the Solomon Islands (Birk and Rasmussen, 2014)). The ad hoc nature of migration and displacement can be overcome by integrating disaster risk reduction and climate change adaptation in national sustainable development plans (Betzold, 2015). In dryland India, populations in rural regions already experiencing 1.5°C warming are migrating to cities (Gajjar et al., 2018) but are inadequately covered by existing policies (Bhagat, 2017).

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