

Dalberg


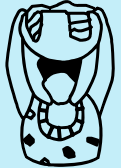


WIRAL + Climate – Insights, Opportunities and Strategy

LITERATURE REVIEW SYNTHESIS -
EXECUTIVE SUMMARY

Disclaimer

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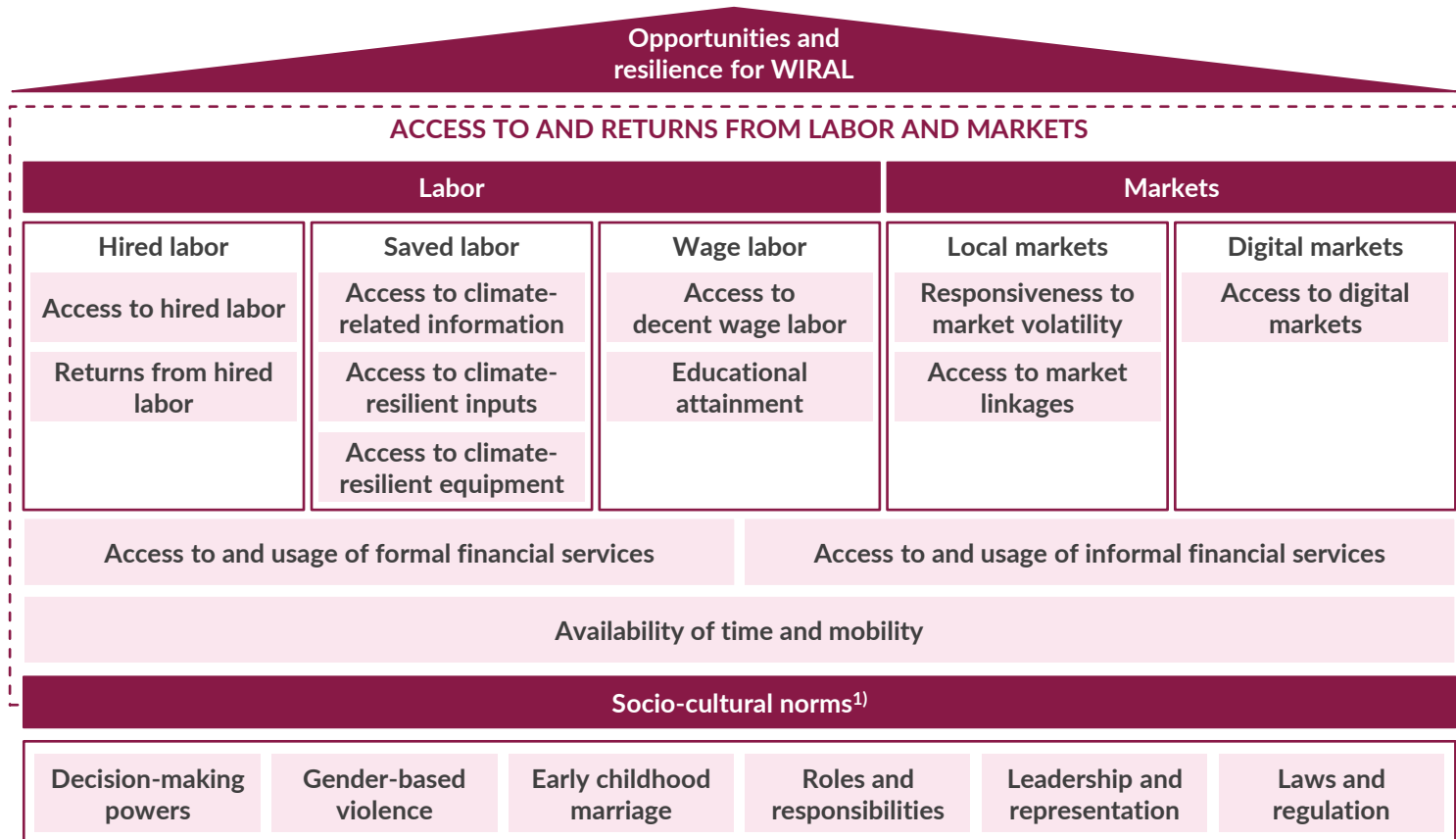
This executive summary is intended to provide a high-level narrative view to answer four key questions

Key findings	1 Impacts of climate change on WIRAL		How does climate change impact WIRAL's access to and returns from labor and markets?
	2 Opportunities for WIRAL to build climate resilience		How can WIRAL be empowered to build resilience in the face of climate change?
	3 Recommendations from the literature for stakeholders		What actions can various stakeholders take to better support WIRAL in building resilience to climate change?
Literature overview	4 Outstanding questions		What are the research gaps and what outstanding questions could warrant further investigation in future research activities?

1

Climate change intersects with the following themes within labor and markets, which are also underpinned by socio-cultural norms






- The literature review assesses the impact of climate change on WIRAL's access to and returns from labor and markets
- It also assesses the inter-linkage of labor and markets with the following six interwoven socio-cultural norms, which are key drivers/barriers to WIRAL's ability to build resilience to climate change



1) Includes history, power and cultural contexts

1






WIRAL's access to and returns from hired labor is reduced by climate change and a lower ability to apply climate-resilient labor practices

		Intersection with climate change	Key drivers (including socio-cultural norms) ¹
Hired labor	<p>Access to hired labor</p> 	<p>WIRAL's ability to hire labor is reduced because of climate change (e.g. due to outward migration, which although predominantly male migration, creates perceived skills gaps as the remaining women have received less training)</p>	<ul style="list-style-type: none"> WIRAL often have lower access to financial resources to hire labor after climate-related shocks WIRAL have lower agency in hiring labor (e.g. seeking spousal consent, lacking confidence) Lower education of WIRAL creates perceived skills gap after outward male migration
	<p>Returns from hired labor</p> 	<p>WIRAL's returns from hired labor are reduced in the face of climate change as they are less likely to be able to understand and oversee the adoption of climate-resilient practices by their hired labor</p>	<ul style="list-style-type: none"> WIRAL have lower access to and understanding of climate-resilient practices WIRAL have lower time and financial resources to invest in the learning and adoption of climate-resilient practices
Saved labor	<p>Access to climate-related information</p> 	<p>WIRAL have lower access to the training (e.g. extension services) and information (e.g. early warning, weather forecasts) required to understand how they can apply climate-resilient practices, which can increase productivity, save time and would enable them to increase their resilience</p>	<ul style="list-style-type: none"> Time and mobility constraints (e.g. due to domestic duties) limit ability to attend trainings Lower digital literacy and device ownership (incl. mobile phones) limits ability to access information Social norms restrict WIRAL attendance of trainings WIRAL are less likely to appear on extension lists
	<p>Access to climate-resilient inputs</p> 	<p>WIRAL are less likely to have access to and knowledge of climate resilient inputs (e.g. seeds, fertilizers) that would enable them to increase productivity, save time and increase their resilience in the face of climate change</p>	<ul style="list-style-type: none"> Socio-cultural norms can restrict WIRAL's decision-making power to determine what agricultural inputs to use and when to purchase them WIRAL often lack the financial resources to purchase inputs (directly or on credit) WIRAL have lower confidence invest in new inputs
	<p>Access to climate-resilient equipment</p> 	<p>WIRAL are less likely to own, use or understand how to maintain mechanized equipment (e.g. solar irrigation) that could enable WIRAL to adopt climate-resilient practices that could increase productivity, save time and build climate resilience</p>	<ul style="list-style-type: none"> WIRAL often lack the financial resources to purchase their own equipment WIRAL needs (e.g. size/weight) are neglected in designing tools WIRAL that own such equipment are more likely to have to sell these to generate emergency liquidity

1) Non-exhaustive - key drivers that are most common for WIRAL

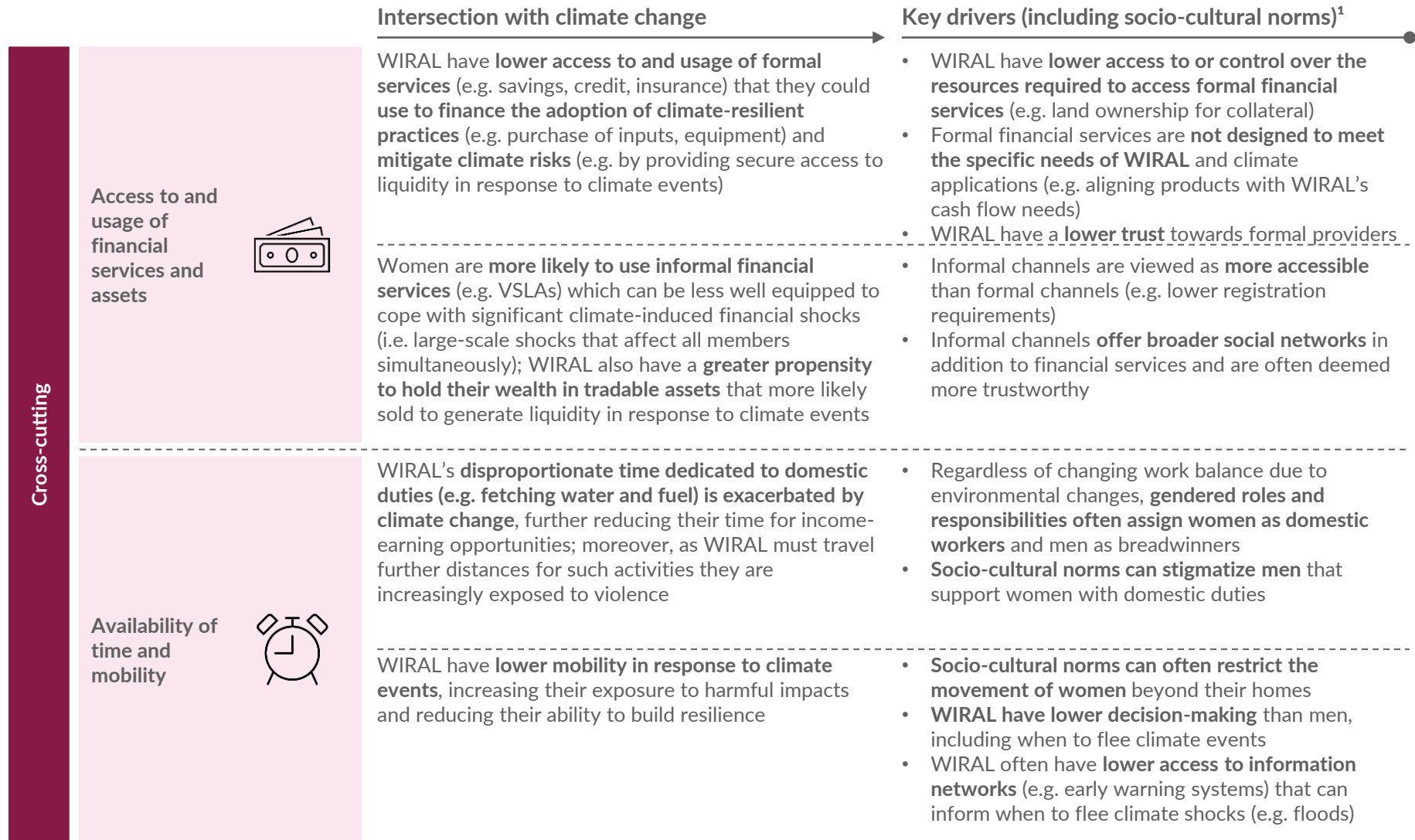
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WIRAL's wage labor opportunities and market access are also often disproportionately affected by climate change

		Intersection with climate change	Key drivers (including socio-cultural norms) ¹
Wage labor	<p>Access to decent wage labor jobs</p> 	<p>WIRAL's access to decent, secure wage labor is often compromised by climate change, with female labor often sacrificed before men's (e.g. due to reduced demand for female labor), whilst working conditions can also deteriorate under the stress of climate change (e.g. due to increase risk of gender-based violence)</p>	<ul style="list-style-type: none"> • Socio-cultural norms influence the view female labor is inferior to men's • Gendered roles (e.g. greater domestic work and caregiving responsibilities to the youth/elderly in the household and community) reduce WIRAL's ability to pursue wage labor opportunities
	<p>Educational attainment</p> 	<p>WIRAL's education is more likely to be sacrificed in response to climate change (e.g. parents are no longer able to afford girls' education or girls are required to support increased domestic work), which thereby limits their longer-term employment prospects</p>	<ul style="list-style-type: none"> • Socio-cultural norms dictate that girls' education is often of secondary importance compared to boys • Gendered roles place greater domestic responsibilities on women in the face of climate events (e.g. spending more time fetching water)
Local markets	<p>Responsiveness to market volatility</p> 	<p>WIRAL have lower visibility of market information and price volatility which are heightened by climate events (e.g. through smaller networks) and a lower ability to respond to promptly to market volatility (e.g. requiring husbands' permission to sell output at a given price)</p>	<ul style="list-style-type: none"> • WIRAL have lower networks for accessing accurate price information • Social norms give WIRAL lower decision-making power over when to sell output and at what price • WIRAL have less access to and control over post-harvest storage
	<p>Access to market linkages</p> 	<p>WIRAL's access to market linkages is disproportionately affected by climate change (e.g. lower physical access), whilst WIRAL's agricultural produce is more likely to be reserved for long-term storage as a precaution against climate events rather than being sold at markets</p>	<ul style="list-style-type: none"> • WIRAL time and mobility constraints can be exacerbated by climate change (e.g. spending more time fetching water), limiting their ability to travel to markets • Socio-cultural norms give WIRAL lower decision-making power over when to sell or store output
Digital markets	<p>Access to digital markets</p> 	<p>WIRAL have lower access to digital marketplaces that would enable them to sustain market access in the face of climate change (e.g. after floods, earthquakes that can restrict access to physical markets)</p>	<ul style="list-style-type: none"> • WIRAL have lower ownership of mobile devices • WIRAL have lower digital literacy to use more sophisticated digital markets (e.g. on smartphones) • WIRAL have lower financial resources to afford mobile devices (e.g. mobile phones, airtime, data)

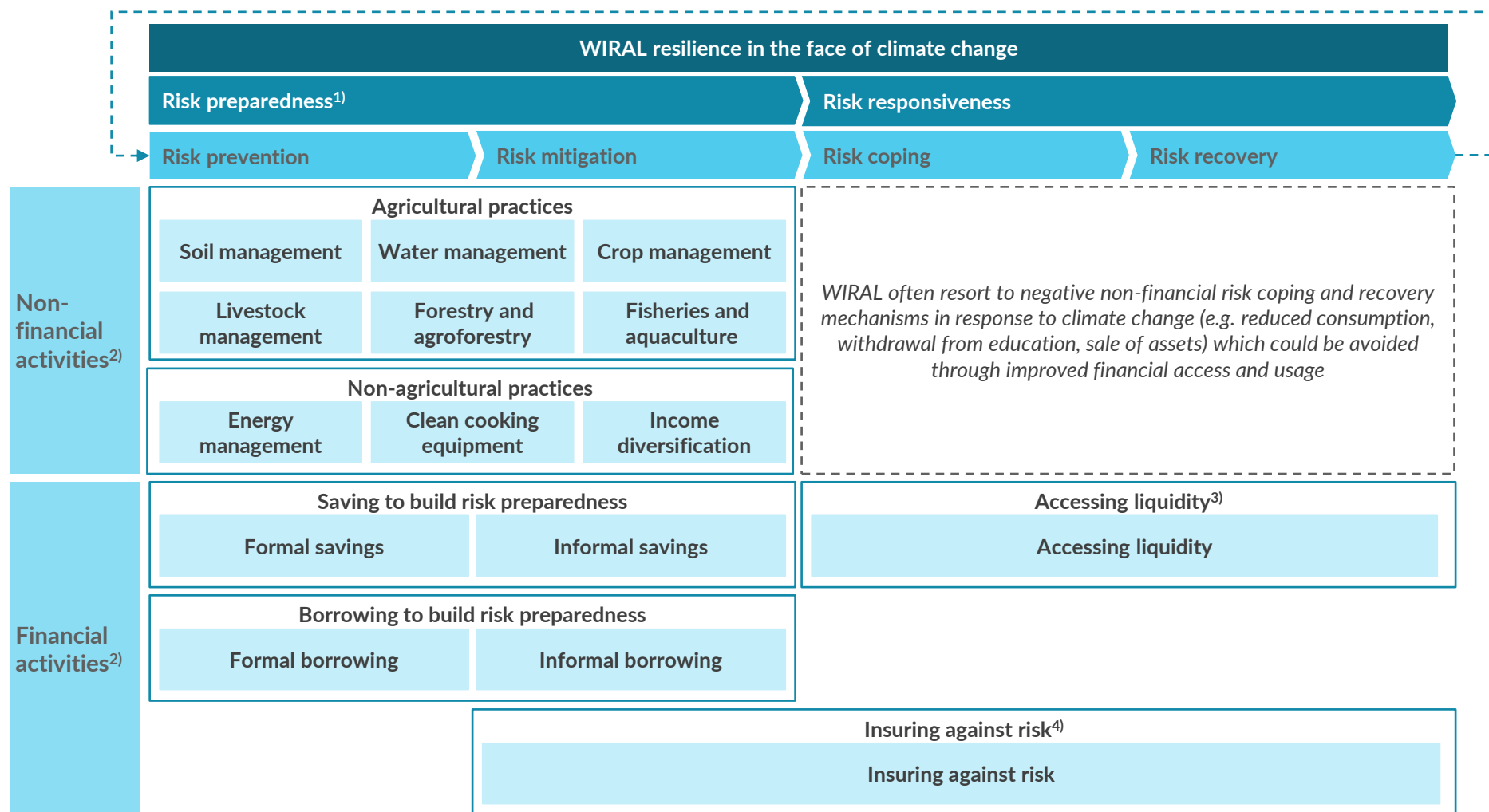
1) Non-exhaustive - key drivers that are most common for WIRAL

Lower access to and usage of financial services and limited availability of time and mobility reduce WIRAL's ability to build climate resilience












1) Non-exhaustive - key drivers that are most common for WIRAL

WIRAL can adopt a range of non-financial and financial activities to increase their resilience to climate change









1) Risk preparedness activities includes both climate mitigation (i.e. efforts to reduce or prevent emission of greenhouse gases) and adaptation (i.e. efforts to respond to and prevent the adverse impacts of climate change) activities; 2) Activities that WIRAL themselves can adopt, which must be supported by a broad range of stakeholders that are the focus of Section V; 3) Includes accessing emergency savings, borrowing and cash transfers; 4) Insurance products can also be used to de-risk investing in risk preparedness measures

WIRAL can adopt a range of non-financial practices to increase their resilience as frontline actors against climate change

		Opportunities for WIRAL to build resilience	Key challenges in WIRAL seizing opportunities ¹⁾
Agricultural practices	Soil management 	Soil management (e.g. not tilling, using climate friendly compost) can promote more resilient crops, increase productivity and build soil health	<ul style="list-style-type: none"> WIRAL have lower access to and usage of equipment required to implement climate-resilient agricultural practices (e.g. WIRAL cannot buy/control equipment, equipment is not designed to WIRAL's needs), which is often driven by socio-cultural norms (e.g. WIRAL's equipment being sold first to generate liquidity) WIRAL have lower awareness of and access to the information and training (e.g. extension) required to understand and adopt such practices Socio-cultural norms limit WIRAL's decision-making power to apply such practices WIRAL have lower access to and usage of financial services (e.g. input credit, asset financing) to enable adoption of climate-resilient agricultural practices WIRAL's time poverty leaves less time to learn and apply climate-resilient agricultural practices WIRAL's lower access to digital technology and digital literacy limits their ability to access and/or understand new climate-resilient practices
	Water management 	Water management (e.g. water harvesting and storage, irrigation) can build more resilient crops/livestock and alleviate WIRAL time poverty (e.g. from fetching water)	
	Crop management 	Crop management (e.g. crop choice, rotation, mulching, crop diversification, use of climate-resilient inputs) can increase resilience, productivity and build soil health	
	Livestock management 	Livestock management (e.g. rotational grazing, manure treatment, cut and carry feeding, dual purpose poultry) can diversify income and promote soil health	
	Forestry and agroforestry 	Planting trees and shrubs (e.g. boundary trees, fruit orchards, windbreaks) can diversify income, reduce erosion and promote carbon sequestration	
	Fisheries and aquaculture 	Integrating aquaculture and climate-adapted fishing techniques (e.g. using ropes instead of nets) into farm systems can diversify income and build resilience	
Non-agricultural practices	Energy management 	Energy-efficient technologies (e.g. solar irrigation) can increase energy efficiency and reliability of energy and alleviate time poverty (e.g. fetching wood, fuel sources)	
	Clean cooking equipment 	Cleaner, alternative cooking equipment (e.g. biomass cookstoves, LPG cooking fuel) can alleviate WIRAL time poverty (e.g. collecting wood) and reduce CO² emissions	
	Income diversification 	Income diversification (e.g. into processing, packaging, cosmetics) can decrease dependency on agricultural livelihoods and exposure to agriculture climate shocks	

1) Non-exhaustive - key challenges that are most common for WIRAL

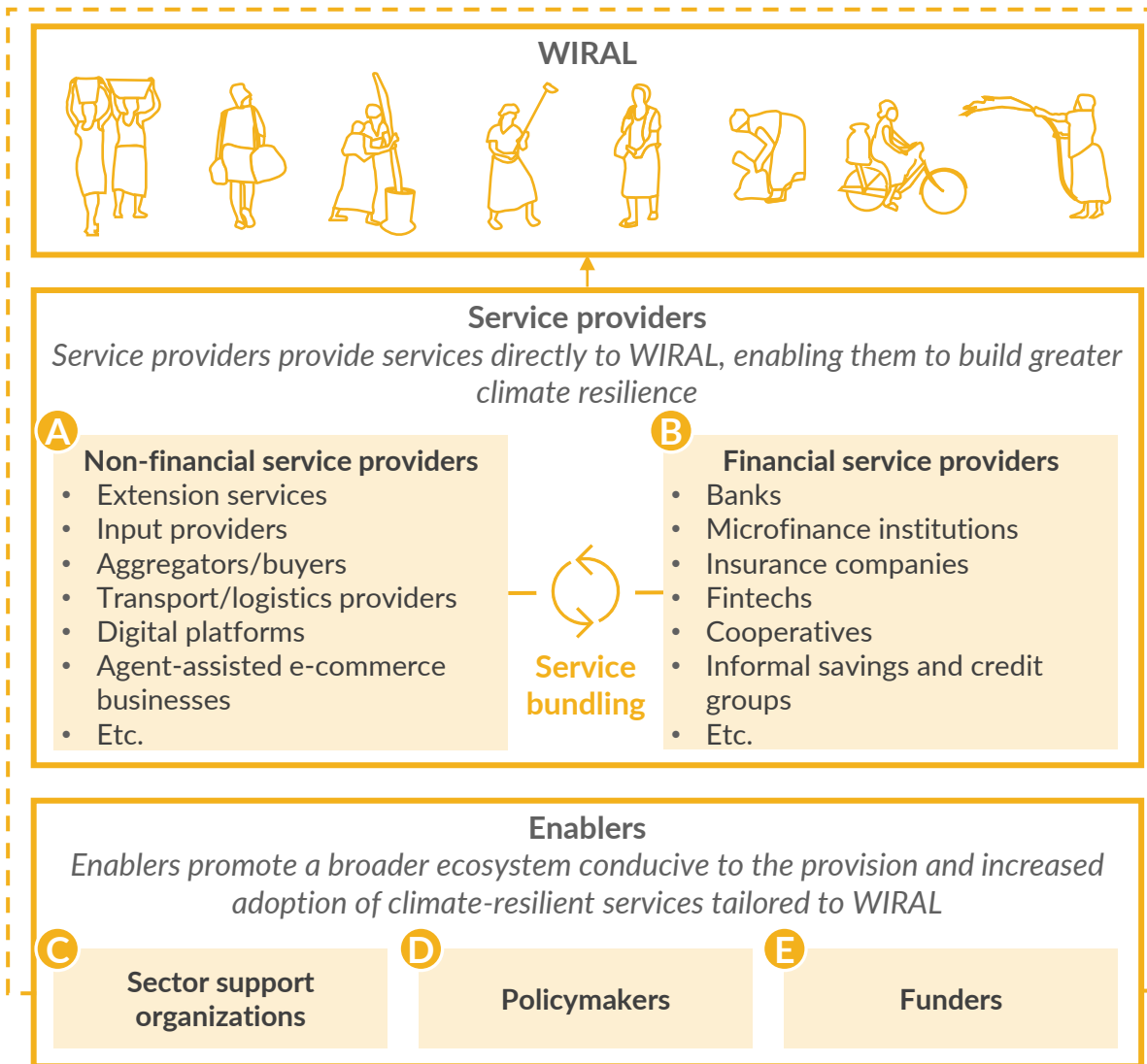
WIRAL can adopt financial practices to enable their adoption of climate-resilient practices, although these come with challenges

		Opportunities for WIRAL to build resilience	Key challenges in WIRAL seizing opportunities ¹⁾
Saving to build risk preparedness	Formal savings 	WIRAL can open savings accounts from formal institutions that enable them to save money to invest in the adoption of climate-resilient practices (e.g. mechanized equipment, inputs)	<ul style="list-style-type: none"> WIRAL have less understanding of savings' benefits WIRAL can be deterred by complex registration requirements (e.g. ID, long application processes) WIRAL have lower accessibility to services (e.g. due to low time/mobility, low availability of rural services)
	Informal savings 	WIRAL can access savings from savings groups (e.g. VSLAs) and other informal channels that enable them to invest in the adoption of climate resilient practices (e.g. mechanized equipment, inputs), whilst also benefitting from such groups' social networks	<ul style="list-style-type: none"> Informal channels can have a lower ability to withstand large-scale climate shocks (e.g. being unable to provide funding in the event of mass withdrawals) and low linkage with formal providers that could increase their resilience
Borrowing to build risk preparedness	Formal borrowing 	WIRAL can access credit from financial institutions to invest in equipment and inputs that enable them to adopt climate-resilient practices; savings groups can also borrow from formal providers and make the money available to their members	<ul style="list-style-type: none"> WIRAL often have a lower ability to qualify for formal borrowing (e.g. lack of collateral, formal ID) WIRAL often have a lower understanding of formal borrowing and its benefits WIRAL often lack the confidence to borrow money
	Informal borrowing 	WIRAL can borrow from informal channels (e.g. VSLAs) to finance equipment and inputs necessary for climate adaptation with greater accessibility than formal channels (e.g. lower qualification requirements) and while still benefitting from such groups' social networks	<ul style="list-style-type: none"> Informal channels can have a lower ability to withstand large-scale climate shocks (e.g. being unable to provide funding for mass withdrawals) Informal channels have lower capital for larger WIRAL investments (e.g. for mechanized equipment)
Insuring against risk	Insuring against risk 	WIRAL can purchase insurance (e.g. crop insurance, livestock insurance or weather-based index insurance) to insure against climate-related risks and increase the security of investing in the adoption of climate preparedness practices	<ul style="list-style-type: none"> WIRAL have a low understanding of the benefits of insurance Insurance products being ill-tailored to meet WIRAL's climate needs (e.g. only covering single risks) WIRAL often mistrust insurance institutions
Accessing liquidity	Accessing liquidity 	WIRAL can access short-term funds (e.g. remittances from friends/family, digital credit) during climate events to meet short-term liquidity needs instead of resorting to negative coping mechanisms (e.g. reduced consumption, withdrawal from education, sale of assets)	<ul style="list-style-type: none"> Short-term liquidity channels are not fully reliable (i.e. not guaranteeing liquidity when it is most needed)

1) Non-exhaustive - key challenges that are most common for WIRAL

3

Broad engagement of stakeholders, including both service providers and enablers, is required to support WIRAL build climate resilience



WIRAL are diverse and heterogenous across different lifecycle stages, livelihoods, geographies and households, and stakeholders must therefore accommodate this wide range of characteristics and needs when trying to support WIRAL build climate resilience

- A Non-financial service providers** provide a range of non-financial services that can help WIRAL build climate resilience (e.g. training, early warning, market access, logistics)
- B Financial service providers** provide a range of financial services that can help WIRAL build climate resilience (e.g. savings, borrowing, insurance, payments)
- C Sector support organizations** include actors that inform and guide service providers and other stakeholders on better serving WIRAL through a range of activities (e.g. research, convening, knowledge sharing)
- D Policymakers** include national and local government bodies that design and implement policy that can either directly or indirectly support the provision and adoption of services for/by WIRAL
- E Funders** include donors and investors that can provide sources of capital to finance the development and delivery of service provided to WIRAL

3

Stakeholders should develop interventions that are targeted to the specific needs of WIRAL and build climate resilience



Capture geographical nuance

Although many impacts of climate change upon WIRAL are common, interventions should recognize the **local context and prevailing socio-cultural norms** that can influence the nature and severity of climate change's impact, and determine the most effective channels for reaching WIRAL



Target the most applicable livelihood or WIRAL segment

Stakeholders should determine the **most important livelihoods or customer segments** (e.g. a specific segment of WIRAL within a specific livelihood or value chain) for interventions, which will have implications for which opportunities have the greatest potential to build WIRAL's resilience



Adopt the most effective non-financial practice(s)

Within the diversity of WIRAL livelihoods stakeholders should **identify which practices have the greatest potential for increasing WIRAL resilience** (e.g. application of practices, use of technologies, use of services) and **adapt these to the constraints already facing WIRAL** (e.g. lower access to labor, time poverty, lower digital literacy, social norms)

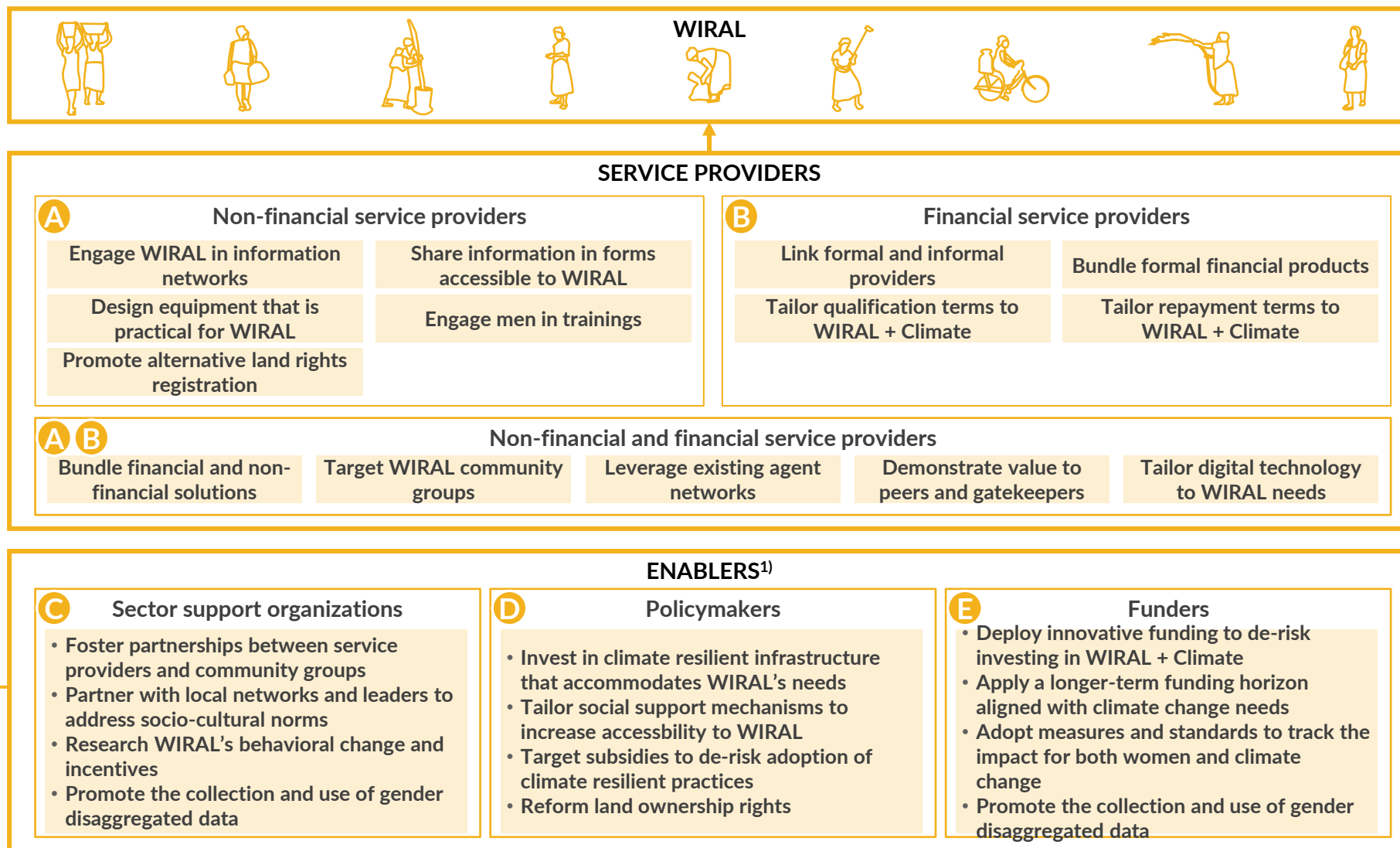


Tailor financing to support these practices

Given the practices being encouraged, **stakeholders should tailor and support financial services that support these specific activities** (e.g. by understanding investment time horizons, perceived risk, cash flow requirements, accessible/existing financial channels and infrastructure)








The literature review identified a range of recommendations on how stakeholders can support WIRAL resilience against climate change







1) High-level recommendations for enablers – the focus of the literature review is on developing recommendations for service providers

Non-financial service providers can apply specific recommendations to increase WIRAL adoption of climate-resilient practices

		Service provider recommendations ¹⁾	How this supports WIRAL build climate resilience
A Non-financial service providers	 <p>Engage WIRAL in information networks</p>	<p>Engage WIRAL and WIRAL groups in the design and implementation of climate-related information networks</p> <p>Ex: Extension services, early warning systems, pricing information networks</p>	<ul style="list-style-type: none"> Engages WIRAL who can better understand and share their own needs and identify the information required to meet them Such WIRAL leadership can also erode social norms
	 <p>Share information in forms accessible to WIRAL</p>	<p>Share climate-related information in formats, times and channels aligned with WIRAL's needs and capabilities</p> <p>Ex: IVR, female extension agents, via existing social, savings and commodity groups</p>	<ul style="list-style-type: none"> Increases the accessibility of climate-related information to WIRAL by circumventing social norms (e.g. gendered roles) and time/mobility constraints
	 <p>Design equipment that is practical for WIRAL</p>	<p>Incorporate WIRAL needs into the design of climate resilient equipment</p> <p>Ex: Planters that do not require oxen, grain storage that is easily accessible and with windows</p>	<ul style="list-style-type: none"> Increases WIRAL's ability to efficiently use climate-resilient equipment (and increases the perceived value of such equipment and associated practices)
	 <p>Engage men in trainings</p>	<p>Conduct joint trainings that engage both men and women in adopting climate resilient practices</p> <p>Ex: Household/participatory trainings</p>	<ul style="list-style-type: none"> Helps erode some social norms blocking WIRAL's adoption of practices, whilst also potentially increasing access to male networks
	 <p>Promote alternative land rights registration</p>	<p>Promote alternative land right registration processes or support WIRAL to circumvent ownership constraints</p> <p>Ex: Digitized land rights registration, land leasing</p>	<ul style="list-style-type: none"> Increases WIRAL's accessibility to land-based collateral that could increase their access to formal finance and agency of land-based decision making






1) For more specific examples see section [in the full Synthesis deck](#) - Recommendations from the literature for stakeholders

FSPs can apply recommendations to increase financial inclusion and enable WIRAL’s adoption of climate-resilient practices

		Service provider recommendations ¹⁾	How this supports WIRAL build climate resilience
Financial service providers	<p>B</p> <p>Link formal and informal providers</p> 	<p>Link formal financial services with existing informal channels embedded amongst WIRAL</p> <p>Ex: Insuring savings groups or extending credit to saving groups</p>	<ul style="list-style-type: none"> Provides greater resilience and/or capacity to informal channels, whilst retaining their pre-existing benefits (e.g. accessibility to WIRAL, social networks)
	<p>Bundle formal financial products</p> 	<p>Bundle formal financial products to provide broader financial support</p> <p>Ex: Offering credit with built in crop and/or livestock insurance, insurance with a savings component</p>	<ul style="list-style-type: none"> Allows WIRAL to build pre-/post-risk resilience, with more security of investing in climate preparedness Offers a more time-efficient service via bundling
	<p>Tailor qualification terms to WIRAL + Climate</p> 	<p>Tailor qualification terms for climate finance to align with WIRAL’s climate needs and capabilities</p> <p>Ex: Using acquired climate-resilient assets as collateral, using alternative data (e.g. digital transaction history) to prove WIRAL credit worthiness</p>	<ul style="list-style-type: none"> Increases the accessibility of formal credit to WIRAL thereby promoting increased adoption of climate-resilient practices
	<p>Tailor repayment terms to WIRAL + Climate</p> 	<p>Tailor repayment terms for climate finance to align with the cashflow needs of WIRAL and climate resilient practices</p> <p>Ex: PAYG solar irrigation, credit for climate-resilient seeds</p>	<ul style="list-style-type: none"> Increases the accessibility of formal credit to WIRAL thereby promoting increased adoption of climate resilient practices

1) For more specific examples see section Recommendations for stakeholders

Recommendations for non-financial/financial service providers can also help increase adoption of climate-resilient services by WIRAL

		Service provider recommendations ¹⁾	How this supports WIRAL build climate resilience
Service providers	<p>A</p> <p>B</p> <p>Bundle financial and non-financial solutions</p> 	<p>Bundle financial services with non-financial services (based on research and understanding of WIRAL needs) to provide more holistic climate resilient services Ex: credit and insurance with education, training and early warning</p>	<ul style="list-style-type: none"> Services are interdependent and mutually reinforcing, increasing the perceived value and adoption by WIRAL Bundled solutions are more time-efficient and can circumvent WIRAL's time poverty challenges
	<p>Target WIRAL community groups</p> 	<p>Target WIRAL community groups, which are already common among WIRAL and have built strong social relationships for the delivery of services Ex: existing social, savings and commodity groups</p>	<ul style="list-style-type: none"> Increases the accessibility of services to WIRAL by using trusted channels, without exacerbating WIRAL time poverty by requiring additional time and travel Enables greater and faster penetration of services amongst WIRAL by leveraging existing relationships to promote adoption of services
	<p>Leverage existing agent networks</p> 	<p>Identify and leverage the most effective agent networks (e.g. extension, input sales agents) for the delivery of services to WIRAL, including using female agents who are viewed as more accessible by WIRAL Ex: extension agents, input sales agents, e-commerce agents</p>	<ul style="list-style-type: none"> Provides greater accessibility of services to WIRAL with time and mobility constraints Enables greater and faster penetration of services amongst WIRAL by leveraging existing relationships to promote adoption of services
	<p>Demonstrate value to peers and gatekeepers</p> 	<p>Engage WIRAL "champion" adopters to demonstrate the value of climate-resilient practices to other WIRAL and gatekeepers Ex: faith-based groups, community leaders (champions), husbands, fathers, mothers/mothers-in-law (gatekeepers)</p>	<ul style="list-style-type: none"> Increases awareness of the value of empowering WIRAL to build climate resilience Erodes social norms that restrict WIRAL decision-making and adoption of climate-resilient practices
	<p>Tailor digital technology to WIRAL needs</p> 	<p>Leverage digital channels to deliver services that are aligned with WIRAL's typically lower technology capabilities which are often also decreased in response to climate events Ex: Community radio, IVR, SMS/USSD rather than apps, deploying human agents alongside digital channels</p>	<ul style="list-style-type: none"> Increases the accessibility of services to build WIRAL's climate resilience by circumventing time, mobility, and digital literacy constraints facing WIRAL

1) For more specific examples see section [Recommendations for stakeholders](#)


Sector support organizations, policymakers and funders can support an enabling environment for WIRAL to build climate resilience

	Enabler recommendations ¹⁾	How this supports WIRAL build climate resilience
Sector support organizations	Foster effective partnerships and collaboration between community groups and service providers	Enhances cooperation between service providers and community groups to accelerate WIRAL's adoption of climate-resilient practices
	Work with local networks, which are well-versed in location-specific cultural realities, to address restrictive social norms	Leverages local knowledge to understand what it takes for WIRAL to erode entrenched social norms that restrict WIRAL resilience
	Undertake research on WIRAL's behavioral change and incentives for the adoption of climate resilient practices	Would shed light on WIRAL's attitudes towards climate-resilient practices, thereby informing how services can be tailored to their needs
	Support the collection and use of gender disaggregated data, including the articulation of clear use-cases and value-add of applying such data	Can improve understanding of WIRAL's use of climate-resilient services and inform how to better design these to meet WIRAL needs
Policymakers	Invest in climate-resilient infrastructure that incorporates WIRAL's vulnerabilities and needs (e.g. water/energy supply)	Supports WIRAL's broader accessibility to and adoption of climate-resilient practices (e.g. irrigation, energy management)
	Tailor and design gender-sensitive social support mechanisms (e.g. naming women as co-recipients of household transfers)	Increases the accessibility of govt-funded liquidity to finance responses to climate events and reduce use of negative coping mechanisms
	Target subsidies to de-risk adoption of climate-resilient practices (e.g. for climate-resilient inputs, weather insurance products)	Reduces the cost of climate-resilient practices making them more affordable to WIRAL, in turn increasing adoption
Funders	Reform land ownership rights and processes to reduce discrimination against WIRAL (e.g. tax rebates for women who register land titles)	Increases WIRAL accessibility to and control over land, which is often a constraint to accessing finance or making land-based decisions
	Deploy innovative funding to de-risk investing in WIRAL/climate-specific services (e.g. guarantees, first-loss tranches)	Catalyzes broader investment in the development of services to build WIRAL climate resilience
	Deploy funding with longer-time horizons more aligned with time horizons of WIRAL investment in adoption of climate-resilient practices	Increases the attractiveness of investing in WIRAL adoption of climate-resilient practices, which are more aligned with funder time horizons
	Adopt measures and standards or build tools to measure and track the specific impacts of investments to both women and climate change	Demonstrates the value of investing specifically in WIRAL/climate solutions, thereby attracting further funding
	Support the collection and use of gender disaggregated data, including the articulation of clear use-cases and value-add of applying such data	Can improve understanding of WIRAL's use of climate-resilient services and inform how to better design these to meet WIRAL needs


1) High-level recommendations for enablers – the focus of the literature review is on developing recommendations for service providers


High-level principles for stakeholders to support WIRAL build climate resilience emerged across the literature

- 1 Incorporate the voice of WIRAL**





Interventions designed to build WIRAL's climate resilience **should understand the different segments of WIRAL, motivations behind their behavioral changes and incentives for adopting climate-resilient practices** and accommodate these accordingly to develop solutions most accessible and attractive to WIRAL


- 2 Avoid the unintentional exclusion of WIRAL**





Many programmes promoting the adoption of climate resilient practices (e.g. carbon credits for agroforestry, flood insurance schemes) **unintentionally exclude WIRAL** (e.g. by requiring legal land titles for registration) and **must therefore incorporate WIRAL needs into their program design to increase adoption**


- 3 Be aware of potentially adverse impacts**





The adoption of some climate-resilient practices **can also bring unintended negative consequences for women** (e.g. the implementation of sustainable land management practices can sometimes exacerbate time poverty) which **should be considered against the benefits of adopting such practices**


- 4 Leverage WIRAL's social capital**




Interventions should seek to **harness – rather than supplant – the trusted and highly valued relationships that WIRAL cultivate through social networks and informal channels** (e.g. VSLAs) to increase the penetration and adoption of services, and use these networks **identify the most vulnerable women in communities**


- 5 Collect and apply gender disaggregated data**



The ability to develop effective, targeted interventions to serve WIRAL is often **contingent on the availability of gender disaggregated data**, which could more accurately inform who to serve and how (including the development of business cases for WIRAL-specific interventions)



Moving forward, targeted research will enable the development of more specific and actionable stakeholder recommendations

Key: ● Outstanding research questions from literature review

Literature review

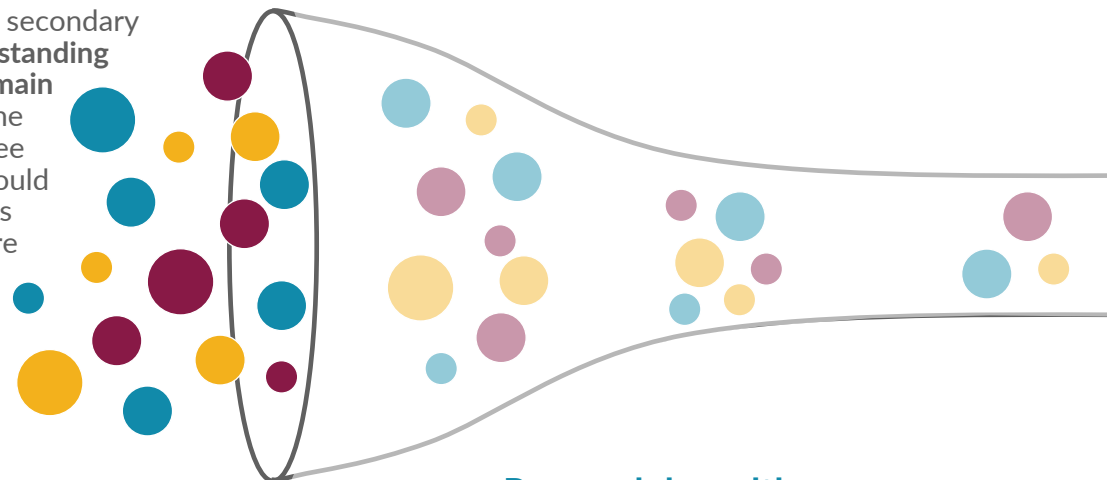
- The literature review is intended to be a **foundational piece of research** that applies a broad lens across existing research at the intersection of WIRAL, climate change and (digital) financial services
- Given this breadth and sole focus on secondary research, **outstanding questions remain** (outlined in the following three pages) that could form the basis of future more targeted research efforts

Prioritization of research themes

- Beyond this literature review, a **next step is to prioritize outstanding themes that warrant further research**; for example, focusing on:
 - Specific climate change impacts aspects within labor, markets or socio-cultural norms
 - Specific non-financial or financial activities that can build WIRAL climate resilience
 - Implementation of specific stakeholder recommendations

Targeted research

- Having determined prioritized research themes, **more detailed research in these areas will enable the development of more actionable recommendations** tailored to specific WIRAL needs (e.g. focusing on specific geography, livelihood, WIRAL segment, non-financial activities and how financial services can support WIRAL)



The literature review as surfaced outstanding questions that could warrant future research (1/3)

Key: ● High research coverage ○ Low research coverage

		Literature coverage	Key outstanding questions
Impacts of climate change	Labor	Hired labor	<ul style="list-style-type: none"> • How does climate change affect WIRAL’s access to labor networks? • How does climate change affect WIRAL managers’ costs of hiring labor (e.g. after outward male migration)? • Are female managers more likely to substitute male labor (e.g. after outward migration) with female labor?
		Saved labor	<ul style="list-style-type: none"> • What approaches (e.g. leasing, local agents) can facilitate adoption of climate-resilient practices? • What role do gendered networks play in sharing climate information and do these disadvantage WIRAL? • What are WIRAL’s behavioral changes and incentives for adopting climate-resilient practices?
		Wage labor	<ul style="list-style-type: none"> • What are the (perceived) skills gaps that limit WIRAL’s ability to replace male labor (e.g. post-migration)? • To what extent do WIRAL retain control of income generated by new, climate-driven wage labor jobs? • Does WIRAL agency for accessing wage labor opportunities increase after outward male migration?
	Markets	Local markets	<ul style="list-style-type: none"> • How do WIRAL retain control of agricultural output allocated for post-harvest storage rather than markets? • How could traders/brokers be leveraged to sustain/increase WIRAL market access after climate events? • Does WIRAL’s market access and responsibility for selling output increase after outward male migration?
		Digital markets	<ul style="list-style-type: none"> • How resilient and responsiveness are digital market platforms to unexpected climate shocks? • To what extent do digital markets incorporate WIRAL needs when providing climate-resilient inputs? • How is WIRAL’s access to digital technology (e.g. data, airtime, electricity) impacted by climate events?
	Cross-cutting	Access to and usage of financial services	<ul style="list-style-type: none"> • How are the most vulnerable (e.g. displaced) WIRAL’s access to and usage of financial services affected by climate change? • How is WIRAL’s confidence and risk appetite for using financial services impacted by climate change?
		Time and mobility	<ul style="list-style-type: none"> • How does WIRAL’s access to transport services in the event of climate emergencies compare to men’s? • Under what circumstances can WIRAL’s time poverty be exacerbated by the adoption of climate resilient-practices?
		Socio-cultural norms	<ul style="list-style-type: none"> • How can levels of GBV and early childhood marriage be reduced in the event of climate-related shocks? • How can gatekeepers be better incentivized to support WIRAL adoption of climate-resilient practices? • Are the roles of gatekeepers diminished after outward male migration and gatekeepers are no longer present?

The literature review as surfaced outstanding questions that could warrant future research (2/3)

Key:  High research coverage  Low research coverage

		Literature coverage	Key outstanding questions
Opportunities for WIRAL	Non-financial activities	Agricultural practices	<ul style="list-style-type: none"> • What are the opportunities for WIRAL to build greater resilience in coastal communities? • When do the costs of climate-resilient practices (e.g. increased time poverty) outweigh the benefits? • What role do social networks play in promoting WIRAL adoption of climate-resilient agricultural practices? • What are the carbon market opportunities emerging specifically for WIRAL?
		Non-agricultural practices	<ul style="list-style-type: none"> • How can community groups collectively invest in the adoption of climate-resilient practices (e.g. energy management systems)? • How do WIRAL ensure they retain full control of income generated through income diversification? • How does income diversification (incl. entrepreneurship) build WIRAL confidence?
	Financial activities	Saving to build risk preparedness	<ul style="list-style-type: none"> • How can WIRAL's preference for saving be aligned with longer-term practices (e.g. growing trees)? • How could informal savings groups be designed to be more responsive to climate shocks? • How can formal savings products be designed specifically to support adoption of climate-resilient practices? • How to physical assets (e.g. land, livestock) act as savings instruments for WIRAL?
		Borrowing to build risk preparedness	<ul style="list-style-type: none"> • What are the most effective models for informal savings groups borrowing from formal providers? • What role do social networks play in promoting WIRAL use of borrowing to finance adoption of climate-resilient practices?
		Insuring against risk	<ul style="list-style-type: none"> • How can insurance companies accommodate WIRAL's cash flow when collecting premiums? • How can insurance companies leverage lower sophistication technologies that are more likely to be used after climate shocks? • How can insurance companies develop broader products that provide holistic cover for WIRAL climate risks?
		Accessing liquidity	<ul style="list-style-type: none"> • To what extent can WIRAL access remittances (e.g. urban to rural, international) after climate shocks? • How can government cash transfers provide liquidity to WIRAL after climate shocks?

The literature review as surfaced outstanding questions that could warrant future research (3/3)

Key: ● High research coverage ○ Low research coverage

		Literature coverage	Key outstanding questions
Recommendations for stakeholders	Service providers	Non-financial service providers	<ul style="list-style-type: none"> • How can service providers promote alternative methods for WIRAL controlling land (e.g. through leasing)? • How can digital market platforms be designed to ensure WIRAL have equal visibility of market volatility? • What are the most effective structures for incentivising adoption of climate-resilient agriculture practices? • What role can non-financial service providers play in increasing market access in the face of climate change?
		Financial service providers	<ul style="list-style-type: none"> • How do FSPs need to change organizationally (e.g. boards, strategies) to better serve WIRAL/climate needs? • How can incentives be designed to promote development of products tailored to WIRAL and climate needs? • How can financial services support WIRAL's effective use of post-harvest storage? • How can credit products be designed to be more accessible to provide emergency liquidity? • How can FSPs use alternative data to understand WIRAL's needs and support access to financial services?
		Non-financial and financial service providers	<ul style="list-style-type: none"> • How can market access services be bundled with specific climate finance products? • How can services be designed to serve the most vulnerable (e.g. displaced) climate-affected WIRAL? • How can (often preferred) in-person channels be sustained in the event of climate disasters (e.g. floods)? • How can service providers effectively increase awareness of and literacy for WIRAL to adopt services?
	Enablers	Sector support organizations ¹⁾	<ul style="list-style-type: none"> • How can sector support organizations ensure carbon credit programmes are better aligned with WIRAL? • How can sector support organizations collect/disseminate information on the benefits of WIRAL climate-resilient practices (incl. to service providers)? • How can sector support organizations help address gendered norms surrounding land ownership?
		Policymakers ¹⁾	<ul style="list-style-type: none"> • How can subsidies be designed to specifically promote WIRAL's adoption of climate-resilient practices? • How can policymakers collect /disseminate information on the benefits of WIRAL climate-resilient practices? • What policies and regulations can promote WIRAL ownership or control of land? • How can policymakers better understand WIRAL needs and incorporate these into policymaking?
		Funders ¹⁾	<ul style="list-style-type: none"> • How can impact investors be channelled more specifically to services supporting WIRAL and climate? • How can global funds available for climate change adaptation and mitigation need to become much more accessible for WIRAL?

1) Recommendations for enablers are derived from higher level research in comparison to the more detailed research focused on service providers