Appendix 1. List of articles included in SLR and their main findings (n=51)

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| **Source** | **Year** | **Country** | **Method** | **Sample** | **Findings** |
| Abi et al. | 2019 | Ethiopia | A controlled experimental design | 52 farmers | * Farmers’ awareness to reduce drought can be elevated through an adapted training for mass-mobilization approach. * Farmers who followed the training were better at mitigating future drought and more aware of the possible impacts of drought on farmland. |
| Alaudin et al. | 2020 | Bangladesh | Surveys | 108 farmers | * Alternate wetting and drying (AWD) irrigation can save water resources and irrigation costs, while increasing crop yield. * Farmers’ adoption of AWD was affected by the age and education level of the household head, access to weather information, land ownership, typography, and soil type. |
| Barbier et al. | 2009 | Burkina Faso | FGDs and surveys | Surveys with 105 (in 2004) + 100 (in 2006) farmers | * Farmers have adopted several techniques to increase yield and reduce its variability. * Growing land scarcity and new market opportunities are why farmers adopt those practices instead of climate variability issues. |
| Bhalerao et al. | 2022 | India | Interviews | >800 farmers | * Despite declining water availability and soil fertility, affected farmers have adopted some low-cost measures to sustain their livelihood. * High production costs and low awareness of efficient technologies are the major barriers to the adaptation by tribal farmers. |
| Bosma et al. | 2012 | Vietnam | Surveys | 94 farmers | * Rice-fish (RF) farming system will provide farmers with a higher farm income and productivity. * Higher input costs are needed compared to conventional farming systems. * Farmers with better access to financial support are more likely to adopt RF system. |
| Branca et al. | 2021 | Malawi and Zambia | Surveys | 505 (Malawi) and 695 (Zambia) households | * Farmers will receive significant economic returns when they switch their conventional practices to climate-smart ones. * The challenge is the high up-front cost of applying a suitable technology. |
| Branca et al. | 2022 | Ethiopia, Malawi, South Africa, and Tanzania | Surveys, interviews, FGDs, and multi-actor platform meetings | 2208 farmers (surveys) | * Farmers with better financial and food-secure status are more likely to adopt agricultural technology innovations. * Technology packages need to consider the complexity and diversity of the smallholder farming systems. |
| Bryan et al. | 2009 | South Africa and Ethiopia | Surveys | 800 (South Africa) and 1000 (Ethiopia) households | * Improved agricultural technologies, water storage facilities, irrigation, and crop varieties may positively affect CC adaptation at the farm level. * Farmers’ access to extension services and financial support is essential. * CC adaptation issues should be addressed based on the specific socioeconomic conditions of a region. |
| Byrareddy et al. | 2021 | Vietnam | Surveys and archival research | 558 coffee farmers (surveys) | * Farmers who implement a combination of mulching and irrigation practices experienced a better adaptation to CC than those adopting only the irrigation system. * However, farmers with more experience have a “no-risk” attitude to drought season, affecting their adoption of mulching practices. |
| Das et al. | 2022 | India | Interviews | 200 farmers | * Farmers prefer to adapt climate-smart agriculture through indigenous technical knowledge. |
| de Lauwere et al. | 2022 | Netherlands | In-depth interviews and surveys | 13 participants (in-depth interviews) and 429 farmers (surveys) | * Higher measures towards circular agriculture (CA) result in farmers’ motivation towards social and environmental values instead of only economic values. * Knowledge, environmental resistance, and legislative issues limit farmers’ transition towards CA. |
| Foguesatto et al. | 2019 | Brazil | Surveys | 172 farmers | * The eco-centric farmers’ pro-environmental behavior is affected by their sense of environmental and cultural aspects. * Financial incentives to adopt SAPs may attract farmers who use economic value as their drivers for a pro-environmental behavior. * The Low Carbon Agriculture Plan can be a solution for both types of farmers. |
| Gutschow et al. | 2021 | Germany | Online surveys and hybrid interviews | 51 respondents (online surveys) and 10 participants for online-offline interviews | * Farmers’ action space can explain their engagement with SAPs. * The implementation of diversified crop rotations as climate mitigation strategy is not economically viable. * Most environmental-friendly practices are not perceived as a ‘business-viable’ strategy as they limit revenue margins and threaten the agribusiness's survival level. |
| Hidayat et al. | 2020 | Indonesia | In-depth interviews, field observations, and secondary data | 10 informants (in-depth interviews) and 64 households (field observations) | * Farmers’ Low External Input and Sustainable Agriculture (LEISA) and organic farming practices have been turned into High-External Input Agriculture (HEIA) after the green revolution program in Indonesia. |
| Iqbal et al. | 2020 | Pakistan | Surveys | 480 farmers | * Agriculture policy influences farmers’ risk toward their farm activities. * Farmers with weak socio-economic status struggled to access information on prices and markets. * Small DAMs can be a priority for risk management strategy. |
| Jabbar et al. | 2022 | Pakistan | Surveys | 440 farmers | * Farmers participating in farmer field school (FFS) have better adoption of SAPs than those who do not participate. * ICT usage, land tenure status, and extension service influence farmers’ FFS participation. |
| Kiani et al. | 2021 | Pakistan | Surveys | 410 farmers | * Farmers have experienced a significant loss of farm income due to crop diversification practices. * The agricultural diversification strategy is environmentally-beneficial yet financially unviable and time-cost. |
| Kmoch et al. | 2018 | Morocco | Survey using qualitative interviews | 32 farmers | * Local knowledge approach suits specific area or socio-economic conditions and strengthen local innovation processes for adaptation options. |
| Kopytko | 2019 | India | Interviews and FGD | 45 farmers (interviews) | * Natural conservation and financial access have motivated farmers to adopt sustainable techniques. * Farmers believed attracting additional innovators required the development of new markets. * India’s Protection of Plant Varieties and Farmers’ Rights Act recognize farmers as plant breeders but does not provide an incentive to innovate sustainably. |
| Kristjanson et al. | 2012 | Kenya, Uganda, Tanzania, Ethiopia | Surveys | 700 smallholder households | * Farmers’ adaptation to SAPs could be affected by many drivers, including the CC issue. However, the differences between each driving force were not significant. |
| Liu et al. | 2022 | China | Surveys | 151 farmers | * Farmers’ CC adaptation strategies can be varied depends on the locations. * Rapid urbanization, low crop farming incomes, and climate warming have affected the invention of sustainable agriculture and rural development. |
| Luu | 2020 | Vietnam | Surveys | 350 farmers | * Educational level, social capital, access to credit, farmland size, farmland tenure status, extension service, and market constraint determine farmers’ adoption of Climate-smart Agriculture (CSA). * Farmers with large production scales are more financially capable and likely to afford CSA technology. |
| Ma et al. | 2022 | China | Surveys | 848 households | * Farmers’ choice to crop variety depends on the risk of income loss. They prefer low potential yield reduction. |
| Maggio et al. | 2022 | Uganda | Surveys | 3123 households | * Organic fertilizer and maize-legume intercropping can be an effective strategy for improving the value of crop production and resilience towards high-temperature deviations. * An increase in farmers’ level of adoption of the strategy will increase the overall benefits. |
| Maharjan et al. | 2022a | Japan | Surveys | 279 farmers | * Some farmers perceived Environmental Conservation Agriculture (ECA) as a strategy to mitigate CC due to the limited use of pesticides or chemical substances. |
| Maharjan et al. | 2022b | Japan | Surveys | 46 farmers | * Direct selling to consumers (farmers-to-consumer market channels) can improve the benefits of implementing ECA, especially for farmers. |
| Makate et al. | 2017 | Zambia, Malawi, and Mozambique | Surveys | 312 farmers | * Farmers’ perceptions to CC may result in using inorganic fertilizers, compost manure, and farmyard manure, as they anticipate poor yields and adverse CC impacts in the future. |
| Maleksaeidi et al. | 2016 | Iran | Surveys | 260 farmers | * Farm households’ resilience to CC can be increased by improving knowledge management. |
| Martinez et al. | 2022 | Brazil | National surveys | 645 municipalities | * Neighboring farmers’ conditions influence one’s adoption of the diffusion of water-saving (localized) irrigation systems. |
| Masud et al. | 2022 | Malaysia | Surveys | 500 farmers | * Economic, social, natural, and institutional barriers limit farmers' adaptation to climate change. * Financial accessibility and price stability of all agricultural inputs are needed to improve farmers’ adaptation practices. |
| Mohring et al. | 2022 | Switzerland | Field observation and experiments | 53 farmers | * Farmers will reduce their use of insecticide during the extreme heat period, resulting in lower total costs of crop production. |
| Molua | 2022 | Cameroon | Surveys | 215 farmers | * Market access, farming experience, farm size, land tenure security, access to extension, and practice to agroforestry enhanced farmers’ potential to adapt to climate issues. * Farm income is highly expected to lose without an adaptation strategy, considering future CC impacts. |
| Musafiri et al. | 2022 | Kenya | Surveys | 300 farmers | * Despite their awareness of CC drivers and effects, smallholders’ capacity to adapt has been limited by unpredictable weather patterns, financial constraints, and lack of agricultural training. * Farmers’ group has been a negative influence on smallholders’ CC adaptation. |
| Nwobodo et al. | 2022 | Nigeria | Semi-structured interviews | 1. armers | * Veterinary services, monthly household income, annual income from ruminant production, and the level of knowledge influence farmers’ implementation of sustainable practices. * Financial inclusion schemes can improve farmers’ adaptation to sustainable practices. |
| Quan et al. | 2019 | China | Surveys | 314 farmers | * The size of the cultivated area, the level of cognition skills, and the accessibility of information influence farmers’ adaptation decisions. * Farmers’ limited adaptation strategies to CC result in false practices, such as excessive irrigation and chemical application, and negatively affect wheat yields |
| Rakotovao et al. | 2021 | Madagascar | Surveys based on scenarios for agroecological practices (AP) | 192 farmers | * AP can potentially to increase smallholder farmers’ productivity and profitability in the long run while mitigating CC. |
| Roesch-McNally et al. | 2020 | The United States (U.S.) | Online surveys | 123 small-scale farmers | * Small-scale farmers were concerned about CC and agreed to change practices to cope with CC uncertainties for a long-term farming benefit. However, they have limited knowledge and skills to deal with the issue. |
| Samuel and Sylvia | 2019 | South Africa | Surveys and FGDs | 346 farmers (surveys) | * Awareness of CC, irrigation access, and the extension visit frequency influence farmers’ adaptation strategies. |
| Sarkar et al. | 2022 | Bangladesh | Surveys | 400 farmers | * Necessary resources, and a set of knowledge, skills, and training facilities can improve farmers’ adoption of sustainable agriculture. |
| Schukat and Heise | 2021 | Germany | Online surveys | 523 farmers | * Smart farming provides more resource-efficient, sustainable, and profitable productions. * Smart products receive a positive perception amongst farmers. * A ‘hedonic motivation’ influences farmers' behavioral intention to use smart products. |
| Setsoafia et al. | 2022 | Ghana | Surveys using the Computer Assisted Personal Interviewing | 1284 households | * Adopting a set of SAPs (improving seed, fertilizers, and soil and water conservations) can stimulate better impacts than a partial adoption of single or two SAPs. * Farmers’ decision to adopt SAPs has been affected by the household’s socio-demographical aspects, plot-level characteristics, extension services, and locations. |
| Sikandar et al. | 2022 | Pakistan | Surveys | 384 farmers | * Between SAPs and agricultural production, foreign aid is a moderation factor to link the two successfully. |
| Singh et al. | 2021 | India | Surveys and FGDs | 182 farmers (surveys) and 7-10 participants in each FGD | * The flood recession farming can upscale community livelihood and food security and improve environmental conditions. * Farmers’ adoption of this strategy was affected by the farmers’ skills and the invention of new technologies. |
| Singh et al. | 2020 | India | Interviews and secondary data | 24 key informants (qualitative interviews) and 60 farmers (quantitative interviews) | * Farmers perceived climate variability as a crucial stressor to the ecological, socio-economic, and political issues. |
| Siulemba and Moodley | 2014 | Zambia | Surveys, key informant interviews, and focus group discussions (FGDs) | 70 households (surveys), 10 males and 10 females for key informant interviews and FGDs | * There is no difference between men and women regarding their practice on managing natural resources. * Larger families have better engagement on SAPs rather than smaller ones. |
| Sohail and Chen | 2022 | Pakistan | “In-depth interviews” | 1200 farmers | * There are strong linkages between farmers' knowledge and adaptation strategies, food security, risk assessment, and livelihood assets. * Farmers are expected to reduce risks as low as possible at any time. |
| Torres et al. | 2020 | Mexico | Surveys | 370 farmers | * Generally, farmers prefer adaptation rather than mitigation actions due to ‘instant’ benefit once it is adopted. * Farmers prioritized actions that provide short-run economic benefits. |
| Trivedi and Sunder | 2021 | India | Desktop review and consultative meetings (interviews) | N/A | * Remunerative markets (agritourism, contract farming, and integrated food processing) can help support farmers’ financial sustainability given their crucial role in the agriculture supply chain. |
| Upadhaya et al. | 2020 | India | Surveys, key informant interviews, and FGDs | N/A | * Despite a practicing sustainable system, farmers modified traditional cultivation system to improve food production and meet the growing food demand. |
| Wilk et al. | 2013 | South Africa | Interviews | 44 farmers | * Small-scale farmers were more vulnerable to CC compared to commercial farmers. * High costs of production inputs, limited access to knowledge, and agricultural techniques affect small-scale farmers' adaptive capacity. |
| Zeweld et al. | 2018 | Ethiopia | Surveys | 350 households | * Farmers’ adoption to land management practices (agroforestry, crop rotation, and compost) have been influenced by their attitudes, access to information, educational level, group membership, social capital, risk attitudes, and labor supply. |