Supplementary Materials

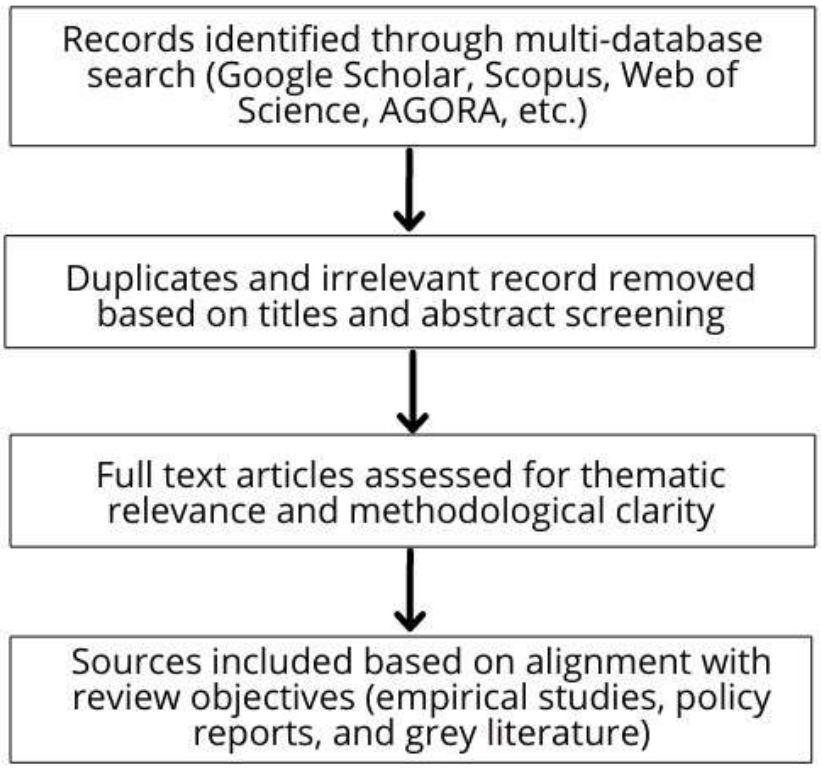


Figure S1: Structured summary of literature screening process

Table S1: Inclusion and exclusion criteria used in the literature screening process

Criterion	Inclusion	Exclusion
Time-frame	Published between 2000 and 2025	Published before 2000
Geography	Focus on Sub-Saharan Africa or globally transferable lessons	Non-African contexts with limited transferability
Relevance	Direct focus on SAPs, climate adaptation, food security, policy, or finance	Purely agronomic trials with no sustainability/climate relevance
Type of publication	Peer-reviewed articles, grey literature, institutional reports	Non-reviewed opinion pieces, preprints, duplicates
Methodological transparency	Clearly reported empirical or theoretical methods	Articles lacking methodological rigor or not retrievable in full-text format

Table S2. Representative quality appraisal of key sources cited in the review. Entries include peer-reviewed, institutional, and grey literature sources categorized by design robustness, policy relevance, and regional applicability.

Source Type	Methodological Design	Geographic Focus	Key Themes	Transferability	References
Peer-reviewed journal	Econometric survey analysis	Ethiopia, Malawi	SAP adoption, gender, tenure	High	[132]
Peer-reviewed journal	Panel data and spatial econometrics	SSA-wide	Gender, climate-smart practices	High	[29]
Peer-reviewed journal	On-farm trials and impact assessment	Ethiopia (Amhara)	Terracing, erosion, productivity	High	[10]
Peer-reviewed journal	Plot-level regressions	Kenya	Agroforestry, yield, water retention	Moderate	[147]
Peer-reviewed journal	Watershed-based empirical study	Ethiopia (Tigray)	Soil bunds, runoff, resilience	High	[37])
Peer-reviewed journal	Integrated modelling and field validation	Ethiopia Highlands	Conservation agriculture	High	[11]
Peer-reviewed journal	Mixed methods (surveys and climate data)	Kenya	Drought impact and adaptation	Moderate	[34]
Peer-reviewed journal	On-farm experiments	Kenya	Conservation tillage and adoption	High	[23]
Grey literature	Expert synthesis + secondary data	SSA	Policy gaps, extension, tenure	Moderate	[8]
Peer-reviewed journal	Watershed-based field assessment	Ethiopia	Runoff, bunds, terraces	High	[37]
Peer-reviewed journal	Longitudinal field surveys	Rwanda	SAP performance by zone	Moderate	[154]
Peer-reviewed journal	Survey + institutional assessment	Nigeria	Adaptation drivers	Moderate	[46]
Peer-reviewed journal	Climate-crop regression models	SSA	Climate projections	High	[48]
Institutional (AfDB)	Foresight + scenario building	Pan-African	Climate-SAP policy futures	High	[25]

Table S3. Directional evidence summary of selected studies evaluating sustainable agricultural practices (SAP) across Sub-Saharan Africa. The table summarizes reported yield and resilience outcomes, effect direction, and approximate magnitude.

Region	SAP Type	Reported Outcome	Effect Direction	Approximate Magnitude	Reference
Ethiopia (Amhara and Tigray)	Fanya juu terraces, grass bunds	Increased maize and teff yields; improved infiltration	Positive	+18–33% yield, +25% infiltration	[10]
Eastern Kenya	Agroforestry + organic inputs	Reduced erosion; improved moisture retention	Positive	–50% erosion; increased water retention	[147]
Northwestern Ethiopia (Gondar)	Soil bunds and soil water conservation practices	Improved productivity and resilience	Positive	+14–20% yield gains	[60]
Kenya (semi-arid)	Climate-smart agriculture + intercropping	Increased income and food productivity	Positive	+10–20% income; +15% yield	[23]
Kenya	Drought coping strategies	Reduced food insecurity under prolonged drought	Positive	Not quantified	[34]
Ethiopia	Stone bunds, infiltration trenches	Runoff reduction, improved biomass production	Positive	~30% erosion reduction	[37]
Ethiopian highlands	Integrated soil and water conservation and composting	Enhanced soil fertility and maize yield	Positive	+19–26% yield; increased soil organic carbon	[11]