Supplement to:

Journal of Agriculture and Rural Development in the Tropics and Subtropics

Vol. 123 No. 1 (2022) 13–30 | https://doi.org/10.17170/kobra- 202201195569

Factors influencing technology adoption among smallholder farmers: a systematic review in Africa

Oluwamayokun Anjorin Fadeyi, Anoma Ariyawardana, and Ammar A. Aziz,

Supplementary materials

Supplementary material A - Online keyword search string

2000 - 2019	**Scopus**	**Web of Sci**	**JSTOR**	**Exclusion**	**Total**
technology AND adoption**	49,870	31,950	95,329		177,149
technology AND adoption* AND Africa**	2,017	1,469	24,377		27,863
*agric** OR *farm** AND *technology** AND *adoption**	3,706	2,255	15,965		21,926
*agric** OR *farm** AND *technology** AND *adoption** AND *smallholder**	434	358	932		1,724
*agric** OR *farm**AND *technology** AND *adoption** AND *smallholder* AND Africa**	194	189	725		1,108
*agric** OR *farm*AND "technology" AND "adoption"* AND *"smallholder"* AND *"Africa"*	187	158	81		426
Duplicates				73	353
Not relevant by study area				43	310
Not relevant by subject area				182	128
Selected articles					128

Supplementary material B - Details of articles reviewed and major findings

No.	Authors	Summary of major findings	Study location	Identified factors																														
				Age	Gender	Marital Status	Education	Household size	Awareness/knowledge	Farming experience	Farm income	Labour	Off-farm income	Farm size	Farm ownership	Farm location	Group m'ship/Social n'work	Market distance	Training	Access to technology	Ease of use	Operational costs	Finance	Research support	Extension contact	Govt. policies and subsidies	Pest/Diseases	Perceived usefulness	Attitude	Culture	Religion	Infrastructure	Soil type	Risk	Climate
1	Orr (2000)	Poverty alleviation using smallholder farming drives technology adoption.	Malawi		X		X	X			X		X	X	X		X						X											
2	Snapp et al. (2002)	The adoption of new technologies depends on market access, labour type, and finance.	Malawi		X			X				X		X				X					X	X	X										
3	Howard et al. (2003)	High-input technologies can be successfully introduced through well-funded high-profile programs.	Ethiopia Mozambique																				X												
4	Mudhara et al. (2003)	Factors such as the composition of the household in terms of fulltime workers, farm size, gender, determine the adoption of improved fallow technology.	Zimbabwe		X	X					X	X	X	X	X								X												
5	Smale and De Groote (2003)	Aside from the performance of the technology, many factors that have incidence at national, regional, and farm levels will affect the likelihood that farmers will adopt transgenic varieties.	Kenya Uganda Tanzania																	X			X	X	X	X		X							
6	Dadi et al. (2004)	Agricultural inputs (area of farmland, labour, credit), extension services and farmers' characteristics (education, gender, age) affect adoption	Ethiopia		X	X		X				X		X									X		X										

		behaviour.																																	
7	Chirwa (2005)	Fertiliser adoption was positively associated with higher levels of education, farm size and higher non-farm incomes, but negatively associated with households headed by women and distance from input markets.	Malawi		X		X						X	X	X			X																	
8	Nkonya et al. (2005)	Agricultural potential, farm size, crop diversity, education, and having non-farm activities, improves the adoption of sustainable land practices.	Uganda				X					X		X		X		X							X										
9	Feleke and Zegeye (2006)	Credit strategy is more powerful than the other factors in terms of raising the probability of technology adoption.	Ethiopia				X					X		X				X					X		X										
10	Ojiem et al. (2006)	Variables that constrain adoption were identified as labour, farm size, farm income, and gender of the farmer.	Kenya	X							X	X	X	X	X			X						X					X	X					
11	Witt et al. (2006)	The adoption of genetic modification technologies is factored by access to credit and markets.	South Africa															X					X												
12	Mutekwa and Kusangaya (2006)	The major constraints facing technology adopters were water distribution problems, labour shortage, and inadequate capital.	Zimbabwe									X					X			X		X	X												
13	Marenya and Barrett (2007)	Farm, off-farm income, family labour supply, education and gender of the household head have significant positive effect on technology adoption.	Kenya	X	X		X	X			X		X	X																					
14	Okalebo et al. (2007)	The cost of technology was identified as an	Kenya																				X												

		important factor in its adoption.																																	
15	Wale and Yalew (2007)	Farmers' attribute preferences change with development-oriented interventions.	Ethiopia	X			X				X		X	X	X	X							X		X		X		X						
16	Khan et al. (2008a)	Farmers' perceptions of the benefits of technology influenced its adoption.	Kenya																								X	X							
17	Khan et al. (2008b)	Net returns achievable from the use of technology drives technology adoption.	Kenya				X							X					X	X		X													
18	Minten and Barrett (2008)	Higher rates of adoption of improved agricultural technologies increases crop yields and lowers food prices.	Madagascar	X	X		X					X																				X			
19	You et al. (2008)	Seed supply, extension, education, participatory decision making, capital, and household assets influence technology adoption.	Tanzania	X	X		X				X		X							X			X		X										
20	Amudavi et al. (2009)	Technology adoption was influenced by farmers' interactions with neighbouring farmers, group memberships, farmer's age, marital status and farmer's level of education.	Kenya	X		X	X										X																		
21	Barbier et al. (2009)	Smallholder farmers adopted a wide range of techniques that are intended to increase crop yield and reduce yield variability.	Burkina Faso										X	X	X	X						X	X					X							
22	Baudron et al. (2009)	Farmers’ norms, culture and perceptions are also important factors for the widespread adoption of technologies by resource-poor farmers.	Zimbabwe Burkina Faso					X		X	X		X							X			X		X										

23	Diagne (2009)	The structure of the adoption gap results from the lack of awareness, finance, and quality extension services.	Cote d'Ivoire Guinea Benin Gambia									X						X		X			X		X										
24	Liverpool and Winter-Nelson (2010)	There is no relationship between participation in microfinance programs and the use of technologies among poor households though the use of certain technologies, like fertilizer, contributes to their asset accumulation over time.	Ethiopia		X			X						X			X						X		X	X									
25	Matata et al. (2010)	Lack of farmers' awareness, training and poor extension contact were the major constraints to adopting improved fallowing technology.	Tanzania	X	X	X	X		X	X							X			X					X			X							
26	Cunguara and Darnhofer (2011)	Use of improved technology did not have a statistically significant impact on household income which may be associated with a widespread drought that occurred in 2005.	Mozambique				X	X				X	X	X		X	X						X		X										
27	Kassie et al. (2011)	The adoption of new agricultural technologies is consistent with increase in crop income and reduction of rural poverty.	Uganda	X			X					X	X	X		X	X			X			X												
28	Mushunje et al. (2011)	Availability of information and perceptions shared by farmers are capable of positively influencing the adoption of Bt maize technology by smallholder farmers.	South Africa						X											X			X					X							
29	Wambugu et al. (2011)	Constraints to adoption include ineffective extension and research services,	Kenya Rwanda Uganda	X	X		X																		X	X									

		inhibitive policies, political interferences, frequent droughts and inadequate monitoring and evaluation systems.	Tanzania																						
30	Asfaw et al. (2012)	The adoption of modern agricultural technology is determined by local supply of seed, access to information and perception.	Ethiopia Tanzania	X	X		X			X		X	X	X		X	X	X		X			X		X
31	Claessens et al. (2012)	Characteristics of the agricultural systems, land use, output, output price, production cost, farm size and household size were found to drive technology adoption.	Kenya					X						X						X					
32	Fischer and Qaim (2012)	Beyond prices, farmer groups function as important catalysts for innovation adoption.	Kenya														X								
33	Lunduka et al. (2012)	Benefits to growing hybrid maize appear to be yield and drought tolerance.	Malawi				X		X					X				X				X	X		
34	Tambo and Abdoulaye (2012)	Among the key determinants of adoption identified is access to technology, inputs, extension services, and information.	Nigeria																	X			X		X
35	Walker et al. (2012)	The participation of smallholder farmers in the contract value chain creates a market linkage that increases the demand for farm product and encourages technology adoption.	Ghana Mozambique	X	X	X	X	X			X	X	X				X			X			X		X
36	Gitonga et al. (2013)	Traditional storage methods do not protect grain well, resulting in large postharvest losses. Hermetically sealed metal silos kill storage pests by oxygen deprivation without pesticides and	Kenya	X	X		X			X												X			

		are now being promoted in Africa.																																	
37	Araya and Mohammed (2014)	The intensity of adoption was influenced by age of the household head, farm size, distance from the local market, farm size, ownership structure and experience in seed production.	Ethiopia	X						X				X				X																	
38	Bergman Lodin et al. (2014)	The adoption of new agricultural technology has effects on different types of households and social actors, but female-headed households are constrained by inferior access to land and by lower de facto sales price.	Uganda	X	X		X	X			X		X	X	X								X												
39	Bezu et al. (2014)	Improved maize adoption has a stronger impact on welfare of poorer households.	Malawi	X			X							X								X				X									
40	Djurfeldt et al. (2014)	The direct role of religion, extension staff and the land tenancy is important in promoting agrarian technology development.	Ghana												X										X						X				
41	Fisher and Kandiwa (2014)	Receiving subsidy increases the probability of adoption of improved maize variety.	Malawi		X		X	X	X							X		X					X			X									
42	Grabowski and Kerr (2014)	Conservation agriculture technology can improve maize yields, but capital and labour constraints limit its adoption to small plots.	Mozambique									X								X		X	X		X			X							
43	Grabowski et al. (2014)	Four key factors - extension contact, availability of herbicides, tractors, and ripper services - all positively influence the adoption of	Zambia																	X			X		X										

		minimum tillage technology.																																
44	Harvey et al. (2014)	Technical, financial and institutional support is needed to improve the adoption of agricultural technology.	Madagascar	X	X	X	X	X			X		X			X		X		X			X	X	X							X		
45	Kabunga et al. (2014)	TC banana adoption increases farm household income and food insecurity.	Kenya	X	X		X	X						X	X								X											
46	Khan et al. (2014)	Awareness of a technology predicted by farmers' access to agricultural information, improved technology adoption.	Kenya																	X								X						
47	Kleemann et al. (2014)	Organic-certified farming yields a significantly higher return on investment.	Ghana	X	X		X							X																				X
48	Lambrecht et al. (2014)	Awareness about a technology is determined by education. Tryout is influenced by extension interventions. Continued adoption requires high level of financial capital.	DR Congo						X			X		X								X	X											
49	Mathenge et al. (2014)	Adoption of hybrid seed contributes to higher farm annual income and raises the asset value of the smallholder farmers.	Kenya		X				X			X		X						X			X									X		
50	Ndiritu et al. (2014)	There are no gender differences in the adoption of specific farm technologies.	Kenya		X		X	X					X			X	X	X							X	X								
51	Nhamo et al. (2014)	The ease of adapting new technologies to local conditions improves adoption.	Burundi Kenya Madagascar Malawi Mozambique Rwanda Tanzania Uganda					X				X		X	X					X				X	X									
52	Rusike et al. (2014)	Household participation influences adoption of improved crop	Democratic Rep. of Congo	X			X		X			X		X				X							X									

		varieties.																															
53	Shiferaw et al. (2014)	Vital investments in agricultural research is required to improve access to modern varieties and services.	Ethiopia	X	X		X	X			X			X		X	X													X			
54	Addison and Schnurr (2015)	Farmer uptake of banana bacterial wilt practices was constrained by a labour shortage.	Uganda						X			X						X													X		
55	Claessens et al. (2015)	New insight into adoption strategies could improve the livelihoods of smallholder farmers.	Kenya	X	X	X	X													X		X											
56	Fisher and Carr (2015)	Gender, access to finance, age and marital status influences the adoption of drought resistant maize varieties.	Uganda	X	X									X								X											
57	Holden and Fisher (2015)	Adoption of drought resistant maize is highly influenced by the socio-economic features of the smallholder farmer.	Malawi					X												X		X	X	X									
58	Kassie et al. (2015)	Technology adoption is influenced by social capital and networks, quality of extension services, government support, pests and diseases, resource constraints, tenure security, education, and market access.	Ethiopia Kenya Malawi Tanzania				X										X						X	X	X								
59	Khonje et al. (2015)	Improved maize varieties have significant poverty-reducing impacts in eastern Zambia.	Zambia	X			X	X	X					X	X	X	X	X	X			X		X									
60	Murage et al. (2015)	Gender, perceptions, awareness, and input market access positively influenced technology adoption.	Kenya Tanzania Ethiopia	X	X		X	X	X	X				X				X	X			X		X				X					
61	Midega et al. (2015)	The presence of weeds and pests is a condition that facilitates the	Kenya Uganda Tanzania																									X					

		adoption of technologies to control them.																																	
62	Ricker-Gilbert and Jones (2015)	Subsidies enable smallholder farmers to purchase post-harvest chemicals.	Malawi	X	X		X							X		X		X					X												
63	Shiferaw et al. (2015)	Agricultural technology adoption in Africa has lagged because of a lack of economic incentives, lack of information, poor seed supply, and credit constraints.	Uganda						X											X			X												
64	Stephen et al. (2015)	This study revealed that simple technologies can enhance the quality of potato used by smallholder farmers every season.	Uganda														X		X	X			X												
65	Dawson et al. (2016)	Relatively wealthy minority smallholder farmers can adopt new technologies, relative to poorer smallholder farmers.	Rwanda	X	X			X		X		X		X	X								X							X					
66	Gouse et al. (2016)	Female farmers adopt labour-saving technologies while higher yields are the main reason behind male adoption of technology.	South Africa	X	X		X	X			X		X																						
67	Gnahoua et al. (2016)	Fertilizer adoption was essential to increasing cassava yield.	Côte d'Ivoire																	X															
68	Hassan et al. (2016)	Farm income, household size, on-farm trials, awareness, extension contact and access to cash are significant factors likely to influence technology adoption.	Nigeria			X		X	X	X	X			X									X		X										
69	Lambert et al. (2016)	Input demand and farm profit of farmers influence the adoption of technologies by smallholder farmers.	Lesotho	X	X	X	X				X														X	X						X			

70	Murray et al. (2016a)	Adoption of virus-resistant seeds that increase yield improves household food security.	Uganda	X	X		X			X				X				X		X			X												
71	Murray et al. (2016b)	Smallholder farmer families headed by women have either limited or no access to basic agricultural tools, transport, and rural energy.	Malawi	X	X	X					X	X	X				X	X		X			X		X										
72	Vidogbéna et al. (2016)	Negative perceptions among farmers, and lack of extension services, reduce technology adoption.	Benin	X	X		X	X		X	X		X	X	X		X											X							
73	Wanyama (2016)	The future of agricultural engineering technology is hinged on several drivers.	Uganda						X			X			X				X				X		X							X			
74	Arslan et al. (2017)	There are strong complementarities between the adoption of new technologies and increase farm yield.	Tanzania				X							X						X			X		X			X							
75	Brown et al. (2017)	A general overview of the adoption of conservation agriculture and its components is determined by its access and influence of extension contact.	Ethiopia Kenya Tanzania Malawi Mozambique																X						X										
76	Cavanagh et al. (2017)	Poor farmers are least likely to adopt improved practices and new technologies.	Kenya									X		X									X												X
77	Chepchirchir et al. (2017)	Increased intensity of adoption of push-pull technology reduces the probability of smallholder farmers' being poor through increased maize yield per unit area, incomes, and per capita food consumption.	Uganda	X	X	X	X	X		X	X		X			X	X		X				X		X										
78	Cheesman et al. (2017)	Closing knowledge gaps in technology influences technology	Zimbabwe						X					X						X			X												

		adoption.																																	
79	Harou et al. (2017)	The timing of a farmer's adoption of pineapple earlier or later relative to their peers has an impact on the intertemporal welfare of the farmer.	Ghana		X																														
80	Hudson et al. (2017)	The use of participatory approach impacted radio listenership, knowledge and initiates the adoption of agricultural technologies and practices presented in radio campaigns.	Malawi Tanzania Uganda						X																										
81	Kunzekweguta et al. (2017)	Farm size and farmer's experience with technology has positive impact on technology adoption.	Zimbabwe	X	X		X	X	X		X	X	X	X	X	X	X		X		X			X											
82	Makate et al. (2017a)	The dynamics of adoption of sustainable agriculture practices improve maize productivity, crop income and food adequacy.	Malawi	X	X	X	X	X		X	X	X	X				X	X					X		X										
83	Makate et al. (2017b)	The adoption of drought-tolerant maize varieties by smallholder farmers significantly enhances overall maize productivity and consequently the quantities set aside for sale and personal household consumption.	Zimbabwe	X	X	X	X	X			X			X		X		X					X												
84	Marenya et al. (2017)	Farmers' access to markets and social capital empirically predicted minimum tillage and mulching adoption.	Ethiopia Kenya Tanzania Malawi	X	X	X	X		X	X		X		X		X		X																	
85	Maliki et al. (2017)	Smallholders' farmers are limited by land access, finance, extension, and research. Benefits, lessons, and challenges are	Benin	X		X	X	X		X	X			X	X		X																		

		discussed in this article.																																	
86	Schreinemachers et al. (2017)	Agricultural policy, investment and technology adoption reoriented towards contemporary nutritional challenges will give high returns on investment.	Tanzania																						X										
87	Toth et al. (2017)	The general lack of knowledge about technology was identified as the main constraint to adoption. Others are lack of market access, inconsistent training, gender disparities, poor land quality, and issues of land tenure.	Malawi	X	X		X		X	X		X		X	X			X	X				X		X										
88	Verkaart et al. (2017)	Increasing access to improved chickpea is a pathway for rural development.	Ethiopia		X			X					X	X																					
89	Wesseler et al. (2017)	The gradual adoption of the technology is delayed by uncertainty and perceived ease of use of the technology.	Benin Niger Nigeria Kenya Uganda	X	X			X			X		X									X	X												
90	Wossen et al. (2017)	Access to extension services and group membership positively impacts the adoption of technology among cassava farmers in Nigeria.	Nigeria		X												X						X		X										
91	Achandi et al. (2018)	Institutional support, access to agricultural inputs, type of technology, household type, socio-cultural characteristics and extension were identified as major constraints to uptake of technology by women farmers.	Ethiopia Madagascar Tanzania					X												X				X	X			X		X					
92	Adejuwon (2018)	Technology adoption fails when it is beyond the financial capability of farmers and culturally incompatible.	Nigeria																X				X		X										

93	Bachewe et al. (2018)	Increased technology adoption is driven by high government expenditures on the agriculture sector and local price incentives.	Ethiopia				X																		X							X			
94	Brown et al. (2018b)	Perception of local community leaders towards the adoption of new technology affects its adoption by members of the community.	Ethiopia Kenya Uganda Malawi Zambia Mozambique	X	X	X		X				X								X			X	X	X			X							
95	Brown et al. (2018a)	Flexibility within extension systems is required for the intensification of agricultural development.	Ethiopia Kenya Uganda Malawi Zambia Mozambique	X	X							X			X		X						X		X	X		X							
96	Chinseu et al. (2018)	Smallholder farmers lack sufficient technical, institutional, social and economic support, which leads to reduced technology adoption.	Malawi	X	X	X	X														X			X											
97	Gebremariam and Tesfaye (2018)	To enhance adoption, high-cost innovations need to be designed to reduce household's exposure to production shocks.	Ethiopia	X	X								X	X		X		X					X		X										
98	Haider et al. (2018)	Programs aimed at increasing technology adoption should consider impacts on bargaining positions within the household.	Burkina Faso	X	X	X											X						X		X										
99	Holden et al. (2018)	Limited information, cash, and access to technology and training, constrain technology adoption.	Malawi																X	X			X												
100	Katungi et al. (2018)	Results demonstrated that investments in climbing bean research and dissemination efforts contributed significantly to improved household welfare.	Rwanda	X	X		X	X						X									X												
101	Kurgat et al. (2018)	Market integration, farm location and	Kenya	X	X		X		X	X				X	X	X	X	X					X		X		X								

		household income were major factors influencing the adoption of sustainable intensification practices.																																	
102	Makate et al. (2018)	Various socioeconomic factors can be associated with adoption and use of climate-smart agriculture practices in smallholder farming.	Zimbabwe	X	X	X	X	X		X	X	X	X	X						X					X										
103	Mekonnen et al. (2018)	There is a statistically significant and positive relationship between networks and the technology adoption.	Ethiopia	X	X		X	X						X		X	X	X	X	X					X										
104	Michalscheck et al. (2018)	Gender, managerial skills, and costs are important factors in adoption decision making.	Ghana	X	X							X								X		X								X					
105	Mukasa (2018)	The use of these modern inputs is found to be decrease risk. However, the higher their purchasing costs, the greater the cost of farmers' private risk bearing.	Tanzania Uganda	X	X		X									X		X				X													
106	Muriithi et al. (2018)	Technology adoption can be achieved through promoting awareness of the technology and offering training through field days.	Kenya	X	X			X	X					X	X	X	X			X			X									X			
107	Mponela et al. (2018)	Key determinants that govern farmers' decisions to adopt new technologies to improve soil fertility include the socio-demography of the farmer, extension access and access to fertilizer.	Malawi Mozambique Zimbabwe Zambia	X	X		X						X				X			X			X					X							
108	Nakano et al. (2018)	Farmer-to-farmer extension programs and training are an effective method to enhance technology	Tanzania																X						X										

		adoption.																															
109	Ronner et al. (2018)	The uptake of climbing bean varieties by smallholder farmers improved production. However, diversity in use displays a lack of information and complicates the measurement of adoption.	Uganda	X	X		X	X		X	X	X	X	X	X				X			X											
110	Senyolo et al. (2018)	Factors such as investment costs and management intensity limit adoption.	South Africa	X	X				X			X							X		X	X	X						X				
111	Senthilkumar et al. (2018)	Smallholder farmers' yield advantages were mainly obtained by improved weed control and harvest technologies.	Tanzania	X	X			X		X									X			X		X								X	
112	Tambo and Mockshell (2018)	Education, secure land rights, and access to institutional support services were identified as factors that increase technology adoption.	Ghana Nigeria Ethiopia Kenya Tanzania Uganda Malawi Mozambique Zambia	X	X		X	X			X		X	X	X		X					X		X								
113	Van Campenhout and Bizimungu (2018)	Adoption of improved inputs such as synthetic fertilizer increases crop yield, but it is considered a risky input. However, its adoption depends on how much extra risk a farm household can afford.	Uganda	X	X		X	X														X											
114	Verkaart et al. (2018)	Adoption of agricultural interventions can increase farm income and retain the smallholder farmers' commitment to farming.	Kenya	X	X		X	X	X			X		X	X				X			X		X									
115	Andrade et al. (2019)	Technology adoption is driven by a generic, transparent, and scientifically robust framework of research and development	Ethiopia Nigeria Tanzania																			X		X									

		aimed at increasing food production and reducing poverty and hunger.																															
116	Burke et al. (2019)	Soil characteristics was found to have an impact on technology adoption as well as the costs.	Zambia																			X											X
117	Brown et al. (2019)	Financial viability of the technology is a consideration in its adoption.	Ethiopia Kenya Uganda Malawi Zambia Mozambique	X	X			X											X	X			X	X	X								
118	Channa et al. (2019)	A one-time price subsidy for the new technology could spur demand and increase future adoption.	Kenya		X				X					X					X														
119	Habtemariam et al. (2019)	Technology adoption has the potential to improve yield and farm income of smallholder farmers.	Tanzania					X			X		X	X						X			X										
120	Krah et al. (2019)	Farmers' propensity to adopt soil fertility management practices increases with improved access to technology - fertilizers.	Malawi																X	X				X				X					
121	Makate and Makate (2019)	Agricultural extension services enhance the adoption of new technologies.	Zimbabwe	X	X	X	X				X		X	X				X		X			X		X		X						
122	Makate et al. (2019)	Multiple adoption of innovations is driven by access to credit, income, information, level of education and farm size of the farmer.	Zimbabwe Malawi	X	X		X				X		X	X	X								X			X							
123	Ochieng et al. (2019)	Technology adoption of improved amaranth varieties was factored by the promotion of improved varieties, mineral fertilizers, and seed treatment technologies.	Kenya Tanzania						X									X					X										

124	Okello et al. (2019)	The structure and content of farmers' mental models differ, and this determines the type of technology to be adopted.	Kenya	X			X									X		X										X							
125	Omotilewa et al. (2019)	Subsidizing an entirely new agricultural technology for smallholder farmers can aid its adoption early in the diffusion process.	Uganda	X	X	X		X			X			X									X												
126	Oyinbo et al. (2019)	Farmers have strong tendencies to adopt new technologies given access to extension, finance and considering the age, gender, and other characteristics of the farmer.	Nigeria	X	X		X				X		X			X	X						X	X	X										
127	Shikuku (2019)	Increased likelihood of information exchange on new technologies is effective in enhancing adoption when the disseminating farmers is female, regardless of the gender of the receiving farmer.	Uganda		X										X																				
128	Tufa et al. (2019)	Farm yields and net crop incomes for adopters of new technologies are significantly higher than those of non-adopters.	Malawi						X								X	X							X										

Supplementary material A - Distribution of literature by crops and location of study

		Crops																				
	Countries	Banana	Cassava	Coffee	Cotton	Fodder shrub	Legumes	Maize	Napier	Oil palm	Pineapple	Rice	Sunflower	Sorghum	Potato	Teff	Vegetables	Wheat	Yam	Millet	Barley	**Total**
1	Benin	1					1	2				1					1		1			**7**
2	Burkina Faso				1			1									1					**3**
3	Burundi											1										**1**
4	Côte d'Ivoire		1									1										**2**
5	DR Congo	1	2				1	1						1	1							**7**
6	Ethiopia		1	1			4	16				1		1		2		4			1	**31**
7	Gambia											1										**1**
8	Ghana		2				1	4			3	1		1								**12**
9	Guinea											1										**1**
10	Kenya	4	1			2	9	25	1			2		1	2		2					**49**
11	Lesotho							1														**1**
12	Madagascar							3				4						2				**9**
13	Malawi		1			1	7	21				2		1			1					**34**
14	Mozambique		1				1	9			1	2		1			1					**16**
15	Niger	1					1	1														**3**
16	Nigeria	1	2				1	6		1		1		1								**13**
17	Rwanda					2	2	1				1										**6**
18	South Africa				1			3														**4**
19	Tanzania	1	1			2	5	12				4	1	1			3					**30**
20	Uganda	4	1		1	2	6	15				4		1	2					1		**37**
21	Zambia				1		1	5									1					**8**
22	Zimbabwe		1		1		5	8				1		1			1					**18**
	Total	**13**	**14**	**1**	**5**	**9**	**45**	**134**	**1**	**1**	**4**	**28**	**1**	**10**	**5**	**2**	**11**	**6**	**1**	**1**	**1**	**293**