**Supplementary material II:**

**Is climate-smart agriculture a silver bullet solution? Challenges pertaining to local knowledge and upscaling in Africa**

Table 1: List of the 30 papers selected for the analysis and themes discussed

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| **No** | **Author/Year** | **Paper title** | **Themes discussed** |
| 1 | Abegunde et.al (2019) | The dynamics of climate change adaptation in sub-Saharan Africa: A review of climate-smart agriculture among small-scale farmers | A, B, E |
| 2 | Aggarwal et.al (2018) | The climate-smart village approach: Framework of an integrative strategy for scaling up adaptation options in agriculture. | A, C, D, E |
| 3 | Akrofi-Atitianti et.al (2018) | Assessing Climate Smart Agriculture and Its Determinants of Practice in Ghana: A Case of the Cocoa Production System | A, F |
| 4 | Alexander (2019) | What climate-smart agriculture means to members of the Global Alliance for climate-smart agriculture. Future of Food | E |
| 5 | Cattaneo & Lipper (2016) | Incorporating forest landscapes into climate-smart agricultural strategies. | A, C, H |
| 6 | Cavanagh et.al (2017) | Old wine, new bottles? Investigating the differential adoption of 'climate-smart' agricultural practices in western Kenya. | A, B, C |
| 7 | Chandra et.al 2017 | The relevance of political ecology perspectives for smallholder Climate-Smart Agriculture: A review | A, C, E, F |
| 8 | Duffy et.al 2020 | Climate smart agriculture extension: gender disparities in agroforestry knowledge acquisition. | D, H |
| 9 | Fentie & Beyene (2019) | Climate-smart agricultural practices and welfare of rural smallholders in Ethiopia: Does planting method matter? | A, H |
| 10 | Fuchs et.al (2019) | Identities, interests, and preferences matter: Fostering sustainable community development by building assets and agency in western Kenya. | C, E, H |
| 11 | Hellin & Fisher (2018) | Building pathways out of poverty through climate smart agriculture and effective targeting. | B |
| 12 | Kamara et.al (2019) | The relevance of smallholder farming to African agricultural growth and development | A, C, D |
| 13 | Kuntashula et.al 2017 | Enabling Agricultural Transformation Through Climate Change Policy Engagement. In Smart Technologies for Sustainable Smallholder Agriculture: Upscaling in Developing Countries | C |
| 14 | Kurgat 2020 | Adoption of Climate-Smart Agriculture Technologies in Tanzania. | A, D, F |
| 15 | Lee 2017 | Farmer participation in a climate-smart future: Evidence from the Kenya agricultural carbon market project. | A, C, E, G |
| 16 | Maindi et.al 2020 | Advancing climate smart agriculture: Adoption potential of multiple on-farm dairy production strategies among farmers in Murang' a County, Kenya | A, C, D, G |
| 17 | Makate 2019a | Effective scaling of climate smart agriculture innovations in African smallholder agriculture: A review of approaches, policy and institutional strategy needs | A, B, C, E |
| 18 | Makate 2019 b | Local institutions and indigenous knowledge in adoption and scaling of climate-smart agricultural innovations among sub-Saharan smallholder farmers | A, B, C, E, G |
| 19 | Martinez-Baron et.al 2018 | Small-scale farmers in a 1.5°C future: The importance of local social dynamics as an enabling factor for implementation and scaling of climate-smart agriculture. | A, C, G |
| 20 | McKune et.al 2018 | Reaching the end goal: Do interventions to improve climate information services lead to greater food security? | D, G, H |
| 21 | Murray et.al 2016 | Smallholder Farmers and Climate Smart Agriculture: Technology and Labor-productivity Constraints amongst Women Smallholders in Malawi | A, D, E |
| 22 | Notenbaert et.al 2017 | Targeting, out-scaling and prioritizing climate-smart interventions in agricultural systems: Lessons from applying a generic framework to the livestock sector in sub-Saharan Africa. | B, C, E |
| 23 | Nyahunda, & Tirivangasi 2019 | Challenges faced by rural people in mitigating the effects of climate change in the Mazungunye communal lands, Zimbabwe | A |
| 24 | Olorunfemi et.al (2020) | Determinants of the involvement of extension agents in disseminating climate smart agricultural initiatives: Implication for scaling up | H |
| 25 | Partey et.al (2018) | Developing climate-smart agriculture to face climate variability in West Africa: Challenges and lessons learnt | A, C, F, G |
| 26 | Scherr et.al (2012) | From climate-smart agriculture to climate-smart landscapes. | A, C, F, H |
| 27 | Shames et.al (2016) | Building local institutional capacity to implement agricultural carbon projects: Participatory action research with Vi Agroforestry in Kenya and ECOTRUST in Uganda | E |
| 28 | Shilomboleni (2020) | Political economy challenges for climate smart agriculture in Africa. | A, B, C, F |
| 29 | Totin et.al (2018) | Institutional perspectives of climate-smart agriculture: A systematic literature review | A, C |
| 30 | Westermann et.al (2018) | Scaling up agricultural interventions: Case studies of climate-smart agriculture | A, C, E, F |

**Note** acronyms A = Barriers to CSA adoption, B = Assumption of homogeneous farmers, C= Institutional support, arrangement, and financial mechanism; D= Gender approaches to upscaling, E = Participation approaches for inclusion of local knowledge, F = Farmers’ right to ownership of land and inputs G = Building social capital and social networks, H = Agricultural advisory support service

Table 2: **Summary of meta data for articles included in the review**

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| **Sr. No** | **Author Name** | **Title** | **Journal** | **Year of Publication** | **Discipline** |
| 1 | Abegunde, V. O., Sibanda, M., & Obi, A. | The dynamics of climate change adaptation in sub-Saharan Africa: A review of climate-smart agriculture among small-scale farmers | MDPI Climate | 2019 | Agriculture, Agricultural economics & Extension |
| 2 | Aggarwal, P. K., Jarvis, A., Campbell, B. M., Zougmoré, R. B., Khatri-Chhetri, A., Vermeulen, S. J., Tan Yen, B. | The climate-smart village approach: Framework of an integrative strategy for scaling up adaptation options in agriculture. | Ecology and Society | 2018 | Agriculture |
| 3 | Akrofi-Atitianti, F., Ifejika Speranza, C., Bockel, L., & Asare, R | Assessing Climate Smart Agriculture and Its Determinants of Practice in Ghana: A Case of the Cocoa Production System | MDPI Land | 2018 | Geography & Agriculture |
| 4 | Alexander, S. | What climate-smart agriculture means to members of the Global Alliance for climate-smart agriculture. Future of Food | Future of Food: Journal on Food, Agriculture and Society. | 2019 | Environment |
| 5 | Cattaneo, A., & Lipper, L | Incorporating forest landscapes into climate-smart agricultural strategies. | Unasylva | 2016 | Economics |
| 6 | Cavanagh, C. J., Chemarum, A. K., Vedeld, P. O., & Petursson, J. G. | Old wine, new bottles? Investigating the differential adoption of 'climate-smart' agricultural practices in western Kenya. | Journal of Rural Studies. | 2017 | International Environment, Development Studies, Environmental and Natural resources |
| 7 | Chandra, A., McNamara, K. E., & Dargusch, P. | The relevance of political ecology perspectives for smallholder Climate-Smart Agriculture: A review | Journal of Political Ecology | 2017 | Earth and Environmental Science |
| 8 | Duffy, C., Toth, G., Cullinan, J., Murray, U., & Spillane, C. | Climate smart agriculture extension: gender disparities in agroforestry knowledge acquisition. | Climate and Development | 2020 | Plant & Agri BioScience, Forest Resources, Conservation, Economics |
| 9 | Fentie, A., & Beyene, A. D. | Climate-smart agricultural practices and welfare of rural smallholders in Ethiopia: Does planting method matter? | Land use policy | 2019 | Environment and climate |
| 10 | Fuchs, L. E., Peters, B., & Neufeldt, H. | Identities, interests, and preferences matter: Fostering sustainable community development by building assets and agency in western Kenya. | Sustainable development | 2019 | Agroforestry |
| 11 | Hellin, J., & Fisher, E. | Building pathways out of poverty through climate smart agriculture and effective targeting. | Development in Practice | 2018 | Agriculture |
| 12 | Kamara, A., Conteh, A., Rhodes, E. R., & Cooke, R. A. | The relevance of smallholder farming to African agricultural growth and development | African Journal of Food, Agriculture, Nutrition and Development | 2019 | Soil Science, Agriculture, and biological engineering |
| 13 | Kuntashula, E., Chibwe, T., & Chabala, L. M. | Enabling Agricultural Transformation Through Climate Change Policy Engagement. In Smart Technologies for Sustainable Smallholder Agriculture: Upscaling in Developing Countries | Smart technologies for Sustainable smallholder agriculture | 2017 | Agriculture |
| 14 | Kurgat, B. K., Lamanna, C., Kimaro, A., Namoi, N., Manda, L., & Rosenstock, T. S. | Adoption of Climate-Smart Agriculture Technologies in Tanzania. | Frontiers in Sustainable Food Systems. | 2020 | Earth Science, Agroforestry |
| 15 | Lee J. | Farmer participation in a climate-smart future: Evidence from the Kenya agricultural carbon market project. | Land Use Policy | 2017 | Environmental science |
| 16 | Maindi, N. C., Osuga, I. M., & Gicheha, M. G | Advancing climate smart agriculture: Adoption potential of multiple on-farm dairy production strategies among farmers in Murang' a County, Kenya | Livestock Research for Rural Development. | 2020 | Agriculture and Resources Economics, Animal science |
| 17 | Makate, C. | Effective scaling of climate smart agriculture innovations in African smallholder agriculture: A review of approaches, policy and institutional strategy needs | Environmental Science and Policy. | 2019 | Agriculture |
| 18 | Makate, C. | Local institutions and indigenous knowledge in adoption and scaling of climate-smart agricultural innovations among sub-Saharan smallholder farmers | International Journal of Climate Change Strategies and Management | 2019 | Agriculture |
| 19 | Martinez-Baron, D., Orjuela, G., Renzoni, G., Loboguerrero Rodríguez, A. M., & Prager, S. D. | Small-scale farmers in a 1.5°C future: The importance of local social dynamics as an enabling factor for implementation and scaling of climate-smart agriculture. | Current Opinion in Environmental Sustainability. | 2018 | Agriculture |
| 20 | McKune, S., Poulsen, L., Russo, S., Devereux, T., Faas, S., McOmber, C., & Ryley, T. | Reaching the end goal: Do interventions to improve climate information services lead to greater food security? | Climate Risk Management | 2018 | Environment |
| 21 | Murray, U., Gebremedhin, Z., Brychkova, G., & Spillane, C. | Smallholder Farmers and Climate Smart Agriculture: Technology and Labor-productivity Constraints amongst Women Smallholders in Malawi | Gender, Technology and Development. | 2016 | Agri-biosciences |
| 22 | Notenbaert, A., Pfeifer, C., Silvestri, S., & Herrero, M. | Targeting, out-scaling and prioritising climate-smart interventions in agricultural systems: Lessons from applying a generic framework to the livestock sector in sub-Saharan Africa. | Agricultural Systems | 2017 | Agriculture |
| 23 | Nyahunda, L., & Tirivangasi, H. M. | Challenges faced by rural people in mitigating the effects of climate change in the Mazungunye communal lands, Zimbabwe | Jàmbá Journal of Disaster Risk Studies | 2019 | Sociology and social work |
| 24 | Olorunfemi, T. O., Olorunfemi, O. D., & Oladele, O. I. | Determinants of the involvement of extension agents in disseminating climate smart agricultural initiatives: Implication for scaling up | Journal of the Saudi Society of Agricultural Sciences | 2020 | Extension |
| 25 | Partey, S. T., Zougmoré, R. B., Ouédraogo, M., & Campbell, B. M | Developing climate-smart agriculture to face climate variability in West Africa: Challenges and lessons learnt | Journal of Cleaner Production. | 2018 | Agriculture |
| 26 | Scherr, S. J., Shames, S., & Friedman, R | From climate-smart agriculture to climate-smart landscapes. | Agriculture and Food Security. | 2012 | Agriculture |
| 27 | Shames, S., Heiner, K., Kapukha, M., Kiguli, L., Masiga, M., Kalunda, P. N., Wekesa, A. | Building local institutional capacity to implement agricultural carbon projects: Participatory action research with Vi Agroforestry in Kenya and ECOTRUST in Uganda | Agriculture and Food Security | 2016 | Agriculture |
| 28 | Shilomboleni, H. | Political economy challenges for climate smart agriculture in Africa. | Agriculture and Human Values | 2020 | Agriculture |
| 29 | Totin, E., Segnon, A. C., Schut, M., Affognon, H., Zougmoré, R. B., Rosenstock, T., & Thornton, P. K. | Institutional perspectives of climate-smart agriculture: A systematic literature review | Sustainability | 2018 | Agriculture |
| 30 | Westermann, O., Förch, W., Thornton, P., Körner, J., Cramer, L., & Campbell, B. | Scaling up agricultural interventions: Case studies of climate-smart agriculture | Agricultural systems | 2018 | Environmental and development studies |