



## PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
<b>TITLE</b>			
Title	1	A Systematic Review of Analytical and Modelling Tools to Assess Climate Change Impacts and Adaptation on Coffee Agrosystems	Page/Line Number 1/2-4
<b>ABSTRACT</b>			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	1/11-30
<b>INTRODUCTION</b>			
Rationale	3	The study will also help identify the potential gaps and future trends for research studies to improve modelling tools to guide farming towards sustainable and resilient management of coffee cultivation under climate change conditions. With this aim, a systematic review approach, already consolidated in the climate and agricultural sciences [41–43], is applied to explore the different modelling tools used to investigate climate change impacts and adaptation on the two major coffee species, Robusta and Arabica. We gave special attention to highlighting the eventual capacity of the available tools to assess the effectiveness of adaptation options.	3/115-121
Objectives	4	The review objective is to identify the modelling tools employed to assess the climate change impact on coffee crops.	3/113-114
<b>METHODS</b>			
Eligibility criteria	5	This review considered literature published in English according to the following criteria: i) Subject relevance (applicable anywhere in the world, including small landholder farmers or commercial systems). ii) Type of intervention (availability of climate scenarios in the literature and tools for assessing resilience to climate change impacts). iii) Comparator (utilization of spatial modeling). iv) Method (distinguishing between qualitative and quantitative modeling). v) Outcome (inclusion of studies that consider production modeling).	1/4-7
Information sources	6	The information collected from these sources database sources (Web of Science, Scopus, and Science direct), Search websites (google, and google scholar), and organisation websites (World bank, FAO, Consultative Group on International Agricultural Research (CGIAR), International Fund for Agricultural Development (IFAD), Natural Resources Institute, Climate Institute Coffee & Climate, International Trade Centre, Fairtrade, Coffee Research Institute, International Coffee Organisation,	1/3
Search strategy	7	The method used in this review consists of the following steps: first, defining the research question; next, developing a PICO (Population, Intervention, Comparison, Outcome) framework to break down the research question into its various components and keywords. Afterward, a keyword search was conducted, and based on the outcomes of the keyword search, a selection of keywords was made, focusing on those that yielded reasonable results across all search engines. Finally, data were collected from various database sources, and for the search on websites and organizational websites, a total of 50 hits were considered.	3-4/124-134
Selection process	8	The Mendeley software was used for screening articles. To ensure the eligibility of each article, each screening was repeated more than once.	1/22-23
Data collection process	9	For data collection, one reviewer was assigned to collect it in a MS Excel spreadsheet and then reviewed by reviewer to ensure it is collected correctly.	1/24-26
Data items	10a	The reviewer searches out the results related to the population of coffee crop, and climate impact assessed by different types modelling tools.	5/Figure 6, 6/Table 5
	10b	The review included variables such as Bibliometric analysis (Region, year of publication, model type, coffee species), Processes reviewed (climate adaptation, and climate impact, thus climate impact sub-divided in Impact of suitability, Impact on production, and impact on pest and disease), Analysis of models and tools (Regression Models, Crop process-based models, and Species Distribution Models), and finally the Climate Change Scenarios ((Special Report on Emission Scenarios (SRES), Representative Concentration Pathway (RCP) and Shared Socioeconomic Pathway (SSP)).	2/35-39
Study risk of bias assessment	11	Please read the paragraphs in manuscript.	1/ 4-26



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Effect measures	12	Please read the paragraphs in manuscript.	1/ 4-26
Synthesis methods	13a	In the manuscript, various categories are explained. These categories are also used to assess the results of each article to determine its placement in a particular category	2/34, 4/66, 5/78, 6/103, 8/226
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	
	13c	The MS Excel is used to present data in figures and table are prepared in MS word.	2/76, 4/135, 5/136, 1/3, 2/28, 3/47, 4/56, 4/64, 5/75-76, 6/102, 10/260-262
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	
<b>RESULTS</b>			
Study selection	16a	Figure 2 in the review presents a flow diagram demonstrating the record of studies at each screening stage, including the studies that were included.	2/28
	16b	All study were included in review that were full fill our criteria,	2/28
Study characteristics	17	Please read the text in manuscript as mentioned their location.	29-256
Risk of bias in studies	18	Please read the text in manuscript as mentioned their location.	29-256
Results of individual studies	19	Please read the text in manuscript as mentioned their location.	29-256
Results of syntheses	20a	Please read the text in manuscript as mentioned their location.	29-256
	20b	We do not perform the meta-analysis.	
	20c	Heterogeneity is not included in study.	
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	
Certainty of	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	



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evidence			
<b>DISCUSSION</b>			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	
	23b	This review has demonstrated the research gap.	12/350-355
	23c	Please read the text in location mentioned.	264-336
	23d	We finally address these results to decision-makers to support scientific and applied policy design and implementation in climate change resilience and adaptation.	356-358
<b>OTHER INFORMATION</b>			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	
Competing interests	26	Declare any competing interests of review authors.	
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

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