



SCIENTIFIC WRITING TRAINING



How to structure a scientific manuscript



Farouk Semwogerere, PhD

16 JUNE, 2026
10 AM – 12 PM

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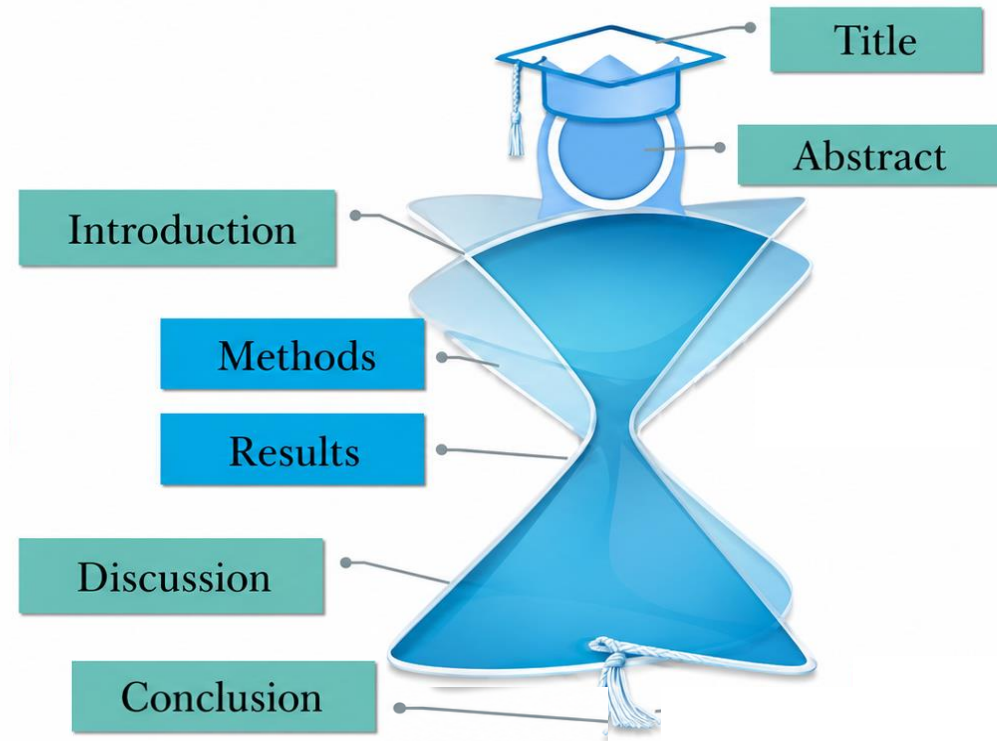


NATIONAL AGRICULTURAL RESEARCH ORGANISATION

ABI ZONAL AGRICULTURAL RESEARCH AND DEVELOPMENT INSTITUTE



Scientific Manuscript Structure



Dr Farouk Semwogerere

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Position

NARO – Senior Research Officer
Post-doc fellow - Stellenbosch University



Key research areas

- Climate-smart animal feeds
- Meat science
- Food process engineers
- Mycotoxins
- AI and Machine learning



Collaborative Partners

Makerere, Kyambogo, and Mbarara University - UG,
Stellenbosch University & University of Pretoria - SA,
Lacombe - Canada



18

Research articles published
(13 original & 5 review)



273

Citations



\$287,000

Research grant secured



13

Invited public lectures/seminars



12

International conference platform presentations



Scopus & Google Scholar

(h-index: 7);
ResearchGate
(h-index: 7)



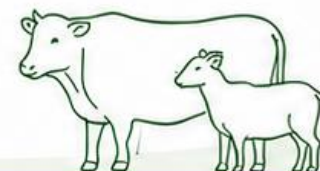
6 PhD & 3 MSc

Student supervisions ongoing



Reviewer for

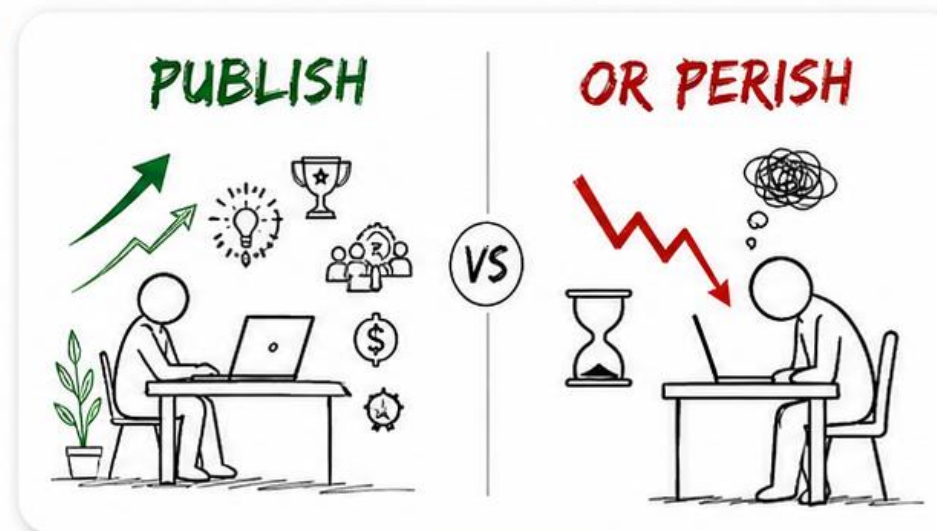
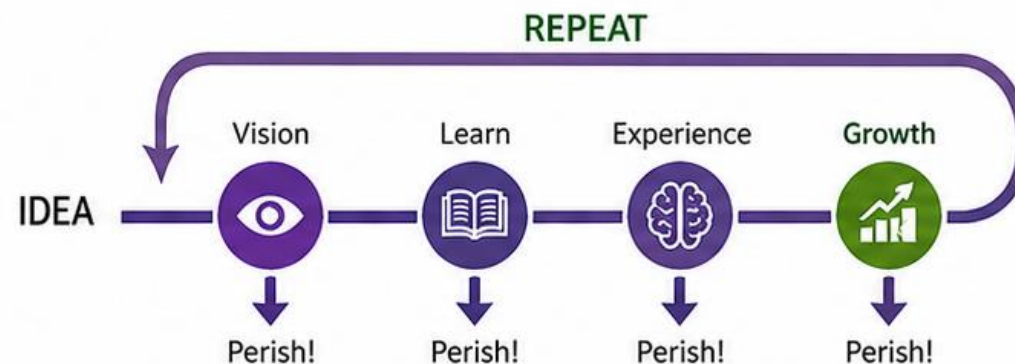
UJAS, small ruminant,
Frontier in animal science,
SAJAS, Discover Animal
& AFST



Why publish?



"Grow or Perish!" – A Call to Action



Publication process

How to Publish a Research Paper in International Journal



The process seems simple, but it might take up to 18 months

Types of manuscripts

1. Short communication

- ✓ < 2500 words
- ✓ 2 figures or tables maximum
- ✓ Concise & address a specific question or area of research

2. Research article

- ✓ < 12000 words (max. 15 pages UJAS)
- ✓ < 8 figures and/or tables
- ✓ Reporting original work

3. Review article

- ✓ < 12000 words (max. 15 pages UJAS)
- ✓ < 10 figures and/or tables
- ✓ Summarizes the current literature available on a specific topic



Choose the manuscript type that best fits your research goals and findings.

Research cycle

THE RESEARCH CYCLE

STEP 01

Identify the Problem

Recognize and define a clear research problem or question that needs investigation.



STEP 02

Evaluate Literature

Systematically review and evaluate the available research and literature.



STEP 03

Create Hypotheses

Develop testable hypotheses or research questions to guide the study.



STEP 04

Research Design

Select the appropriate methods, tools, and techniques for data collection and analysis.



STEP 05

Describe Population

Define the target population and determine the scope and context of the research.



STEP 06

Data Collection

Gather relevant data using appropriate procedures and instruments.



STEP 07

Data Analysis

Examine and analyze the data to identify patterns, relationships, and insights.



STEP 08

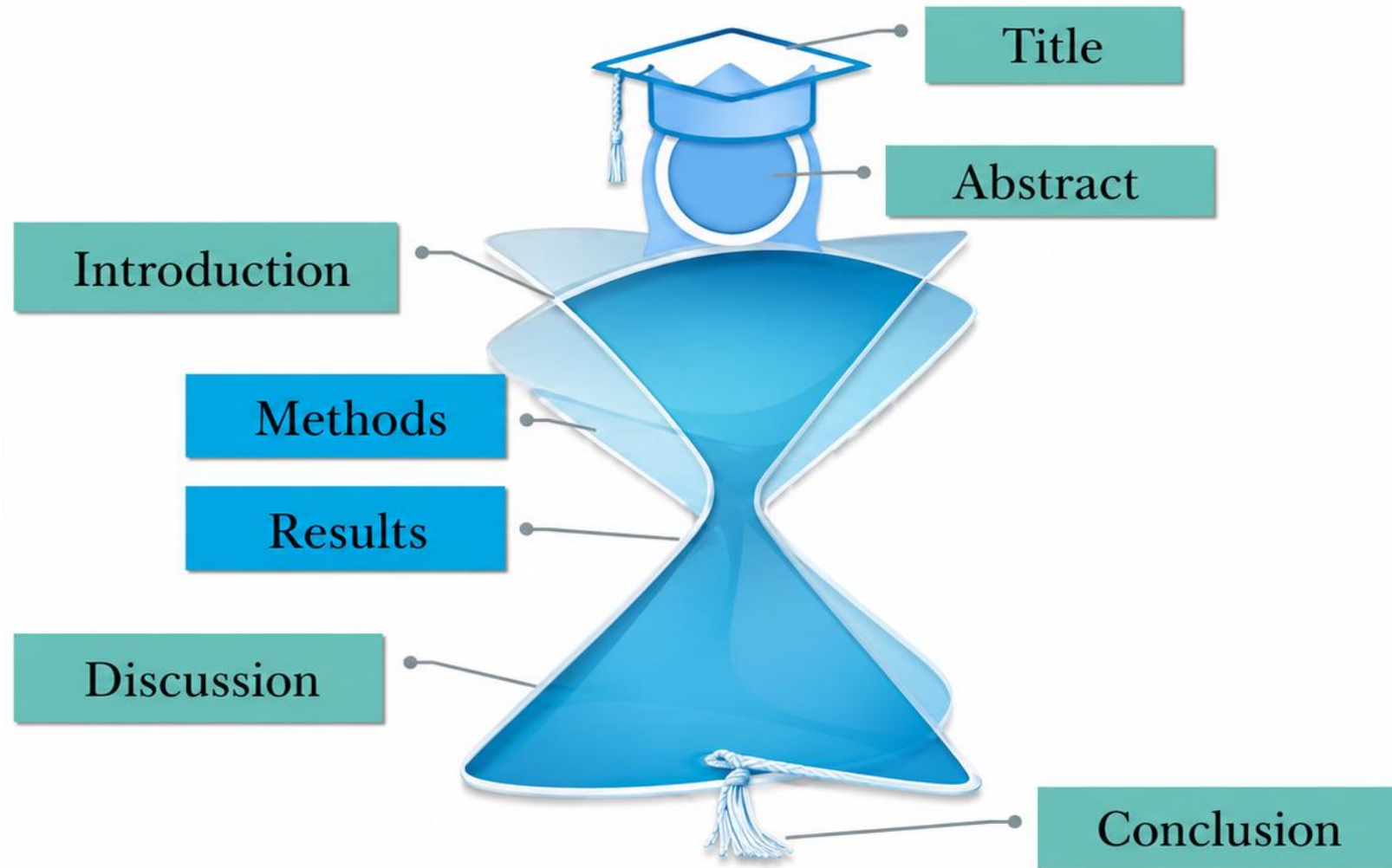
Report Writing

Present the findings, conclusions, and recommendations in a clear and structured report.



A manuscript/article is as good as a research proposal, data collection and analysis

Research article structure



Article title

Informative and concise, providing an overview of the research

Include main and specific study keywords, exclude extra and unspecific ones

Captivating and memorable enough to attract potential readers

Effective Research Title

Retrievable by search engines

Avoid using ambiguous term, technical jargon or abbreviation



Title page



1. Title

- ✓ < 20 words (UJAS)
- ✓ Short, concise and informative
- ✓ Novelty and catchy



2. Authors

- ✓ Who qualifies to be an author?
- ✓ Order of the authors – first and corresponding author*
- ✓ Author's contribution
- ✓ Corresponding contact details



3. Authors' address

- ✓ Present/permanent address of the authors



Tip:

The title page provides the first impression of your research—make it clear, professional and complete.

1. Title
(< 20 words)

Engaging
and catchy

1 **Growth, Yield and Forage Quality of Maize (*Zea mays* L.)**
Varieties under Saline Conditions

3 Farah Muhammad¹, **Bilal Ahmad^{2*}**, Khalid Mehmood³, Sana Iqbal¹
4 & Shabbar Ali¹

2. Authors
(order)

5 ¹ Department of Animal Sciences, Faculty of Life Sciences, University of Agriculture,
Faisalabad, 38040, Punjab, Pakistan

6 ² Department of Soil Science, Faculty of Agricultural Sciences, University of Agriculture,
Faisalabad, 38040, Punjab, Pakistan

7 ³ Institute of Agronomy, Bahauddin Zakariya University, Multan, 60800, Pakistan

3. Authors'
address

8 *Corresponding author: Bilal Ahmad (bilal.ahmad@uaf.edu.pk)

9 Corresponding author details

10



Clear & informative
title



Correct author
order



Complete affiliations
& contact details



Professional
presentation

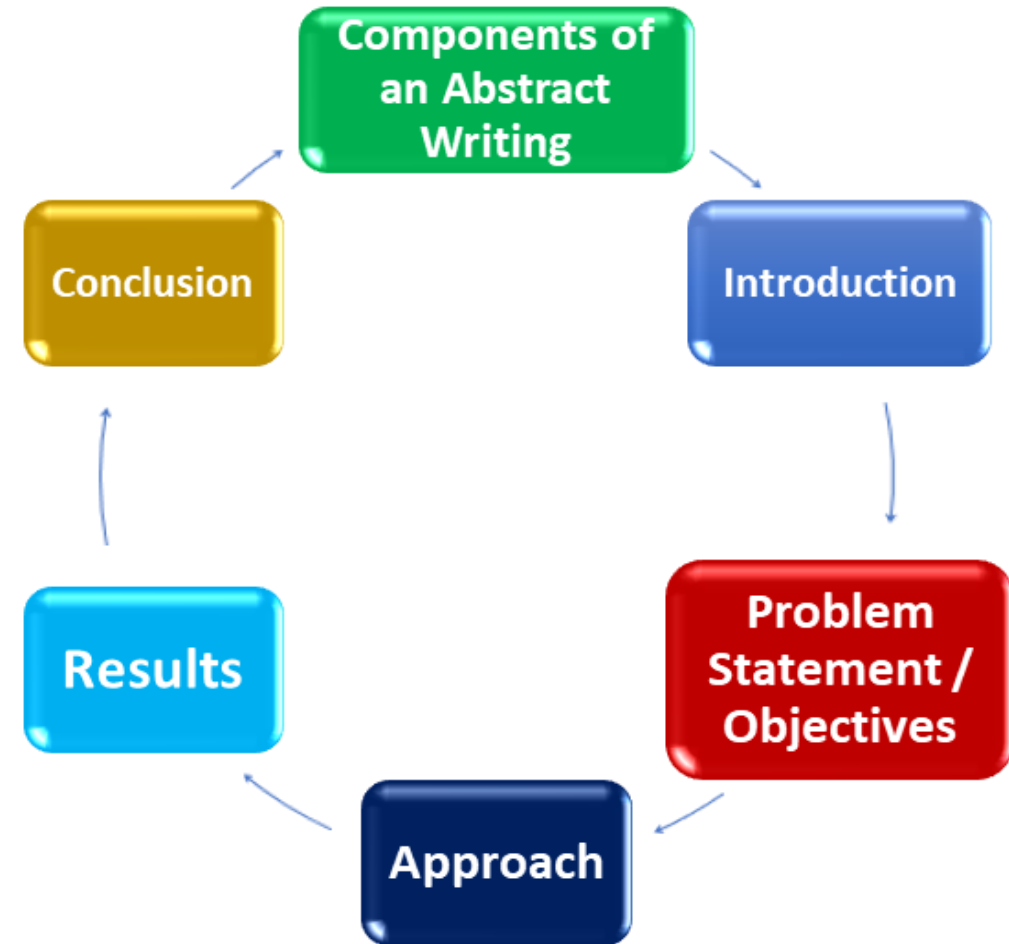
Highlights

- 📖 3 – 5 (85 character each) bullet points
- 📖 Avoid abbreviations
- 📖 Short, concise and informative
- 📖 Capture research novelty
- 📖 Avoid words already in the title



Abstract

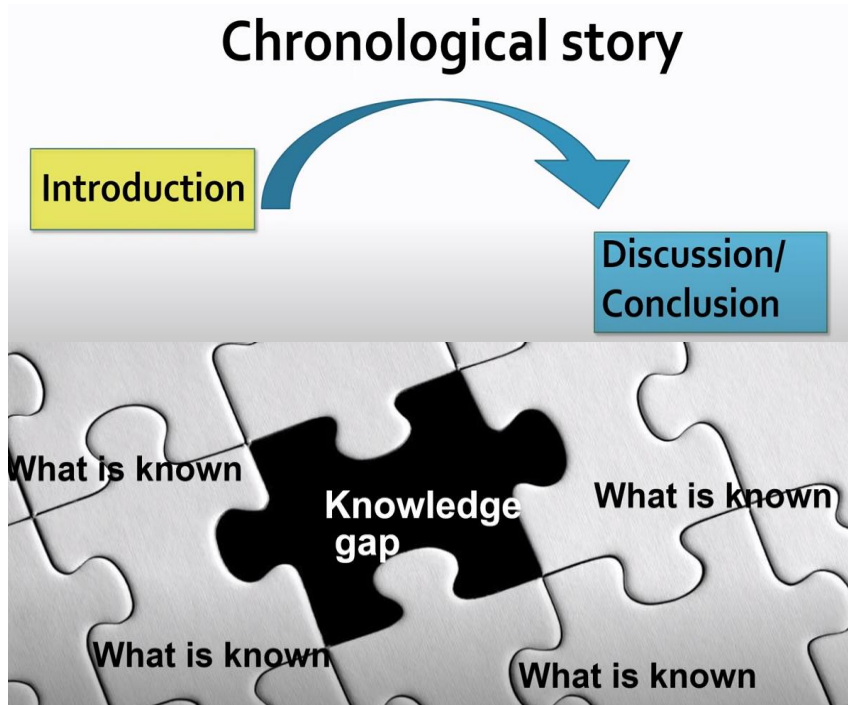
- 250 words (**UJAS**)
- Concise and factual
- Objective, methodology, results and conclusion
- Avoid abbreviations unless defined
- Last section of manuscript to be written
- STAND-ALONE**



Background

Background

- Short, concise and informative (1 paragraph)
 - Clearly highlight the problem statement
 - In-depth review of available literature
- Provides the **scope** of your research
 - A **summary** of **relevant literature/knowledge in the field** and the **underlying context**
 - Is typically structured from general information to narrow or focused ideas
 - As **informed by the identified topic**
 - It should be about 10% of the proposal



Problem statement

📖 An overview description of a difficulty or lack that needs to be investigated

📖 It should direct attention to:

- The **issues**
- Their **causes**
- The **gaps**
- The **impact** they pose

📖 It should ultimately identify **potential solutions**

- Reality vs desire
- Principle vs practice

Generalized problem

Targeted and well-defined problem

Clearly informing the research purpose

- Focused research
- Careful decision-making

Purpose & rationale

Justification

- Research novelty
- Contribution of the study to body of knowledge
- Outputs, outcomes and implications

Ask your

- What new knowledge does study generate or solve a problem?
 - Does the study fill the existing gaps?
- Who benefits from the study and how?
- How does the study advance understanding or influence policy?
- How does the study resolve current controversies/complexities?



Objective

📄 **A clear statement of the specific purposes of the study (1 sentence)**

- Identifies the key study variables and their possible interrelationships
- Identifies nature of the population of interest

📄 **This is where you make the study tangible**

- Describing how you are going to go about it



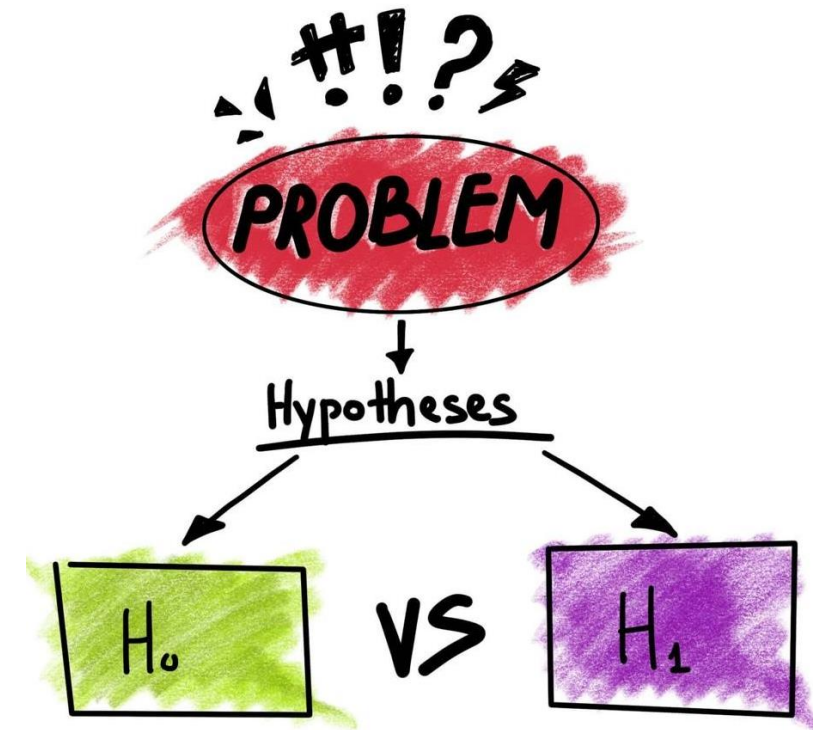
Research question

- 📄 **The specific study purpose is stated in the form of a question or statement**
- 📄 **What is the primary question you are trying to solve?**
- 📄 **Articulating the essence of your study and its scope**
- 📄 **It is usually 1 or 2 sentences**



Hypothesis

- 📖 An intelligent guess of the research outcome
- 📖 The specific study purpose is stated in terms of a tentative prediction
 - Describes what you expect to happen
- 📖 A prediction of the answer to the research question
 - Null hypothesis – H_0 (No difference)
 - Alternative hypothesis – $H_{1/a}$ (There is a difference)



Materials and methods

1

Research Ethics and regulatory approval

Mandatory to protect the rights and welfare of subjects involved

2

Research/ Experimental Design

Broad scope system guiding structural and experimental path
Experimental unit, replicates and pseudo

3

Population of Study

The complete demographic group or target subjects under analysis.

4

Area of Study

The geographic boundaries and ecological environment of the study.

5

Sample & Sampling

The protocols and techniques used to draw valid, unbiased sub-groups.

6

Instrumentation

Formulation of physical or conceptual tools for empirical capture

7

Administration

Deployment control & validation testing of instruments
Follow guidelines for analysis and reporting (% vs mg/100g)

8

Methods of Data Analysis

The statistical models, tools, and logical reasoning for scientifically rigorous research outcomes.

Provide sufficient details for the reproducibility of the study

Results

**Clear
&
concise**

Main trends

**Align with
objective**

**Tables
&
Figures**

Strictly describes results. Do not discuss results

Discussion

01



EXPLAIN SIGNIFICANCE

Deliver the deep scientific meaning and weight of your results directly, avoiding any repetitive recitation of raw findings.



02



INTERPRET & CITE

Contextualize your results thoroughly by integrating high-impact historical references and validated peer citations.



03



ALIGN OBJECTIVES

Anchor your narrative path tightly back to your primary research objectives and starting investigative pillars.



04



PROVIDE RANGES

Integrate and debate precise boundary threshold values, contrasting empirical bounds against past models.



05



HIGHLIGHT GAPS

Clearly map unresolved areas and research anomalies that remain unaddressed or unexplained by your data.



Do not repeat results

Conclusion

01

KEY FINDINGS

Summarize the most important results of the study.



02

IMPLICATIONS

Explain the significance of the findings and their broader impact.



03

SUPPORTING EVIDENCE

Highlight the data and analysis that support the conclusions.



04

LIMITATIONS

Acknowledge the constraints and limitations of the study.



05

RECOMMENDATIONS

Provide actionable suggestions based on the findings.



06

FUTURE RESEARCH

Identify areas for further investigation and potential studies.



CONCLUSIONS

Bringing together key findings and insights to draw meaningful implications and recommendations.

Acknowledgements

01



FUNDING

- ✓ Research fund details
- ✓ Unique identification numbers

02



ANALYTICAL/TECHNICAL SUPPORT

- ✓ People in the study but don't qualify as authors



Referencing

01



WHAT TO REFERENCE

- Journal articles and books – priority 1
- World organization reports – FAO, World bank etc.
- If possible, avoid magazines, news, and unofficial websites



02



TIME RANGE

- More recent is better
- Avoid literature more than 10 years older except classics



03



INTEXT AND REFERENCE LIST STYLE

- Follow journal referencing guidelines
- Adapt style of referencing software – Mendeley



*Good referencing reflects good research.
Be credible. Be consistent. Be current.*



Types of review article

01



SYSTEMATIC LITERATURE REVIEW

It follows a clear and systematic methodology for collecting and analysing papers to reduce bias.

02



SCOPING REVIEW

It identifies the key concepts, data sources, and type of evidence underpinning a research area.

03



INTEGRATIVE REVIEW

It critically reviews the literature to identify the strengths, weaknesses, and gaps for future research.

04



NARRATIVE REVIEW

It synthesizes the literature to identify patterns, trends, and gaps in research.

05



HISTORICAL REVIEW

It studies how a particular research topic or area evolved over time.

06



META SYNTHESIS

It integrates, interprets, and synthesizes qualitative findings from individual qualitative studies.

Review article Structure



1. Introduction

- Background Context
- Importance of Topic
- Purpose & Scope



2. Review Method

- **Search Strategy:** Documenting databases used (Scopus, Web of Science, Google Scholar) and specific Boolean terms.
- **Keywords:** The list of primary & secondary search terms, and how they appeared in full-text search.
- **Inclusion & Exclusion:** Clear criteria used to screen and include or exclude studies.
- **Quality Assessment:** Tools or checklists used to assess study quality, and how quality informed analysis.



3. Thematic & Conceptual Body

- **Overview:** The key developments and trends in the topic.
- **Themes & Theories:** Organizing findings by major thematic areas.
- **Variables:** Detailing key factors (or independent and dependent variables).



4. Analysis & Synthesis

- Compare studies
- Identify patterns
- Strengths and weaknesses
- Inconsistencies



5. Research Gaps

- Highlighting missing pathways,
- Identify unanswered questions or areas of conflict.
- Map conceptual boundaries.
- Outline specific methodological flaws needing immediate attention.



6. Conclusion

- Summarizing the general state of knowledge.
- Draft critical takeaways.
- Frame the logical conclusions of the review with neutral and intellectual punch.



7. References

- All cited sources

Follow the top-to-bottom flow

Plagiarism check

01



Use software such as Turnitin and iThenticate

- ✓ Less than 20 similarity index with each source < 1%

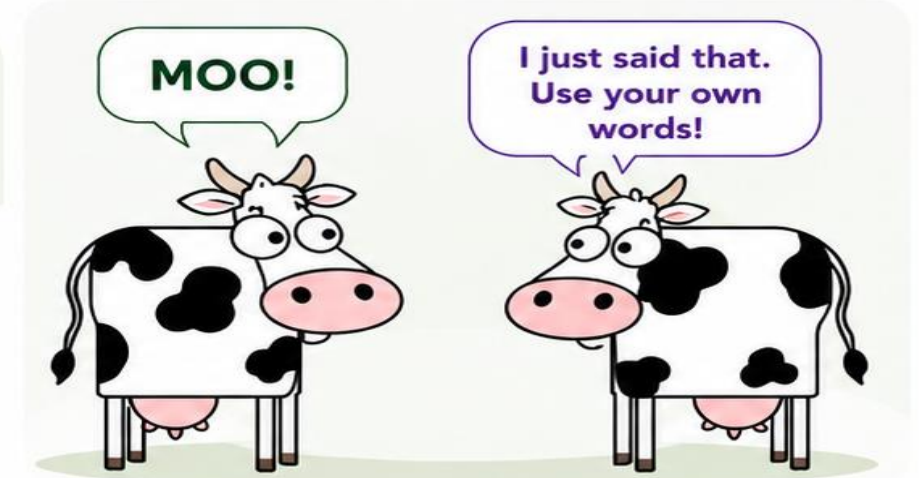


02



Use paraphrasing tools to reduce the similarity index

- ✓ ChatGPT
- ✓ Wordtune
- ✓ Quillbot



Original work. Honest research.
Proper citation shows integrity.



Pre-submission check

01



Format manuscript

- ✓ Use author guidelines provided by journal
- ✓ Sometime journals provide manuscript formatting tools

02



Prepare required documents

- ✓ Cover letter
- ✓ Declarations: Conflict of interest, AI, author declaration
- ✓ Author contributions
- ✓ 3 minimum potential reviewers



Author Guidelines



A well-prepared submission reflects a strong research.
Check carefully. Submit confidently.





THANKS FOR LISTENING



Your attention drives discovery forward.



QUESTIONS ARE WELCOME



RELEVANT RESEARCH
Addressing real-world
agricultural challenges



RIGOROUS METHODS
Sound and transparent
approaches



RELIABLE RESULTS
Evidence-based
and trustworthy



REAL-WORLD IMPACT
Driving sustainable
agricultural development