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Sample study plan for MZOP 001 (IGNOU M.Sc. Zoology, MSCZOO)

What this file is. The MZOP-001 Handbook on Dissertation/Project Work (Discipline of Life Sciences, School of Sciences, IGNOU, January 2025) lists among its important highlights: "No need to submit synopsis of the Project." There is nothing to post or upload at the start of MZOP 001. What the Handbook does ask is that you discuss the topic, objectives, literature, methods, techniques, data processing, limitations and a budget estimate with your supervisor (sections 1.5 and 1.6). This file shows one way to put that discussion on paper before fieldwork begins. The same plan later becomes the base of Chapter 1 (Introduction) and Chapter 3 (Research Design and Methodology) of your report.

How to use it. Every [square bracket] is a fact only you can supply: your district, fields, dates, numbers and readings. Your supervisor decides the final design. Do not copy this plan or its wording; choose your own topic with your supervisor. Every number in your report must come from your own fieldwork or laboratory records.

A rule from the Handbook. Section 1.6 asks learners to avoid ChatGPT or other AI tools while drafting the dissertation, and to keep the plagiarism level within 10 per cent. Write your plan and report in your own words.

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1. Working title

Diversity and flower visitation of insect pollinators on Indian mustard (*Brassica juncea*) fields near and far from semi-natural habitat in [block, district, state], Rabi [year]

Why this fits MZOP 001. The Handbook says the suggested titles are based on the Semester IV courses, and its list includes "Beekeeping practices and their influence on pollinator biodiversity" and "Taxonomic diversity and diversity of insect habitats" (section 1.7). This working title is a separate direction that uses the same courses:

Course	What it gives this study
MZOE-006 Applied Entomology	Pollinators and honey bees as beneficial insects
MZOE-004 Insect Taxonomy and Morphology	Identification of visitors to order, family and genus
MZOL-004 Lab Course IV	Field collection and handling of insects
MZO-007 Principles of Ecology	Diversity, abundance and habitat concepts
MZO-006 Biostatistics and Bioinformatics	Diversity indices and tests of difference
MZO-009 Research Methodology	Objectives, hypotheses and design

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2. Background and rationale

Klein et al. (2007) reviewed leading global food crops and reported that most of them benefit from animal pollination. Ricketts et al. (2008) synthesised 23 studies on 16 crops and found that pollinator richness and native visitation rate both decline with distance from natural or semi-natural habitat; visitation fell to half of its maximum at about 0.6 km, and richness at about 1.5 km. In India, Bijarniya et al. (2024) recorded the insect pollinator fauna of Indian mustard in the Rabi 2021-22 flowering season and found *Apis mellifera*, *A. dorsata* and *A. cerana indica* among the main honeybee visitors.

Gap to confirm with your own literature search: [whether any published study has compared pollinator diversity on mustard fields at different distances from semi-natural habitat in your district or agro-climatic zone; name the closest studies you find and what they did not measure].

Rationale: [two or three sentences in your own words on why the answer matters for growers, beekeepers or habitat management in your area].

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3. Research questions and hypotheses

RQ1. Which insect taxa visit the flowers of *B. juncea* in the study fields during the flowering period?

RQ2. Do pollinator diversity and flower visitation rate differ between fields near semi-natural habitat and fields far from it?

RQ3. At what hours of the day is visitation highest?

H_{01}: There is no significant difference in Shannon diversity (H') of flower visitors between near and far fields.

H_{02}: There is no significant difference in visitation rate (counts per m^2 per 5 minutes) between near and far fields.

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4. Objectives

1. To record the insect taxa visiting *B. juncea* flowers in [n] near and [n] far fields in [district].

2. To compare species richness, Shannon diversity (H'), Simpson diversity (1-D) and evenness between near and far fields.

3. To compare flower visitation rates between near and far fields.

4. To describe the hourly pattern of visitation from [time] to [time].

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5. Study area, fields and period

Item	Your entry
District, block, villages	[ ]
Near fields	[n] fields whose edge lies within [100] m of semi-natural habitat such as [grove, scrub, canal bank]
Far fields	[n] fields more than [600] m from any such habitat (distance chosen with reference to Ricketts et al., 2008; agree it with your supervisor)
Mustard variety and sowing date	[ ]
Flowering window observed	[date] to [date]
Collaborating institution (the programme page asks learners to collaborate with institutions)	[name, for example an entomology department or Krishi Vigyan Kendra, and the person who agreed]

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6. Methods of data collection

a. Quadrat counts. In each field, [n] 1 m^2 quadrats of flowering plants are watched for 5 minutes at [times]; every insect touching anthers or stigma is counted by taxon. Counting per m^2 per 5 minutes follows the unit Bijarniya et al. (2024) used for bee counts on Indian mustard.

b. Transect walks. A fixed transect of [length] m along the crop is walked at a steady pace on [n] days; visitors are recorded on the data sheet. Westphal et al. (2008) found that transect counts carry an observer bias, so the same observer walks every transect.

c. Pan traps (only if your supervisor agrees). Westphal et al. (2008) found pan traps the most efficient method for sampling bee diversity. Pan traps kill the insects they catch, so keep the number of traps and days to the minimum your supervisor approves.

d. Identification. Visitors are identified with keys from MZOE-004 and checked by [name of expert or institution]; voucher specimens are labelled with date, field and collector.

e. Weather. Temperature and relative humidity at each count: [instrument].

Field code	Distance class	Date	Time	Quadrat no.	Taxon	Visits in 5 min
[ ]	[near / far]	[ ]	[ ]	[ ]	[ ]	[ ]

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Field code	Distance class	Date	Time	Quadrat no.	Taxon	Visits in 5 min
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Data sheet shell: keep it empty until you are in the field.

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7. Data processing and analysis

Measure	Formula	What it tells you
Richness S	Number of taxa recorded	How many kinds of visitors
Shannon H'	$H' = -\sum p_i \ln p_i$	Diversity weighted by evenness (Shannon, 1948)
Simpson 1-D	$1 - \sum p_i^2$	Chance that two visitors differ in taxon (Simpson, 1949)
Pielou J	$H' / \ln S$	Evenness from 0 to 1 (Pielou, 1966)
Margalef d	$(S - 1) / \ln N$	Richness corrected for sample size (Magurran, 2004)

H_{01} can be tested with Hutcheson's t-test for Shannon indices (Hutcheson, 1970) and H_{02} with [Mann-Whitney U or t-test, as your supervisor advises]. Software: [R / PAST / spreadsheet]. Chapter 3 of the Handbook's report order asks you to name the software and any AI tools used for data processing.

Sentence frame for later: "Shannon diversity was [ ] in near fields and [ ] in far fields; Hutcheson's t = [ ], p = [ ]; hence H_{01} is [rejected / retained]."

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8. Ethics and permissions

Written permission from each farm owner; no interference with spraying schedules; no collection of any species listed in the schedules of the Wild Life (Protection) Act, 1972; minimal lethal sampling. Section 1.6 of the Handbook asks you to record your daily observations or data in a laboratory notebook and to take your mentor's permission before using the data elsewhere.

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9. Limitations

[One flowering season only; [n] fields; some visitors identified to genus only; weather on count days. Write the limitations that truly apply to your study.]

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10. Budget estimate (the Handbook names budget as one of three elements)

Head	Amount (Rs)
Travel to fields	[ ]
Pan traps, vials, labels, preservative	[ ]
Hand lens, thermometer-hygrometer	[ ]
Printing and binding	[ ]
Total	[ ]

11. Six-month timeline (the Handbook sets six months and at least 120 hours)

Month	Work	Done
1	Supervisor consent letter and bio-data approved; literature	[ ]
2	Field selection, permissions, pilot counts	[ ]
3 to 4	Flowering-season counts and identification	[ ]
5	Analysis; Chapters 1 to 4 drafted and shown to supervisor	[ ]
6	Chapters revised; certificates; report ready by the batch deadline	[ ]

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12. Planned chapters (Handbook section 1.9)

Chapter 1 Introduction (purpose, problem, rationale, objectives, hypotheses); Chapter 2 Review of Literature; Chapter 3 Research Design and Methodology; Chapters 4 and 5 Results and Discussion; Conclusion. The Handbook expects a report of 5,000 to 6,000 words excluding references, and generally seven to eight chapters; divide them with your supervisor.

13. References (APA, alphabetical; the Handbook allows not more than 100)

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Ricketts, T. H., Regetz, J., Steffan-Dewenter, I., Cunningham, S. A., Kremen, C., Bogdanski, A., Gemmill-Herren, B., Greenleaf, S. S., Klein, A. M., Mayfield, M. M., Morandin, L. A., Ochieng', A., Potts, S. G., & Viana, B. F. (2008). Landscape effects on crop pollination services: Are there general patterns? *Ecology Letters, 11*(5), 499-515. https://doi.org/10.1111/j.1461-0248.2008.01157.x

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[Add the Indian and local studies you read yourself.]

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