



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

FACULTY OF NATURAL RESOURCES AND SPATIAL SCIENCES

DEPARTMENT OF ARCHITECTURE AND SPATIAL PLANNING

QUALIFICATION	BACHELOR OF REGIONAL AND RURAL DEVELOPMENT		
QUALIFICATION CODE:	07BRAR		
COURSE CODE:	IEM621S	COURSE NAME:	INTEGRATED ENVIRONMENTAL MANAGEMENT
NQF LEVEL:	6	NQF CREDITS:	12
SESSION:	January 2020	PAPER:	THEORY
DURATION:	3 HOURS	MARKS:	100

SUPPLEMENTARY/SECOND OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER(S)	Mr. Cyrlus Tjipetekera
MODERATOR:	Dr. M. Hauptfleisch

<ol style="list-style-type: none">1. Answer ALL the questions2. Write clearly and legibly3. Number the answers clearly4. Do not forget to write your Student Number on the Answer Book(s)
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THIS EXAM PAPER CONSISTS OF 4 PAGES (Including this front page)

Question 1

- a) What do you understand by the term Global Change? (2)
- b) Why do you, a future Regional and Rural Development Planner, have to study and be able to apply the Namibian Environmental Management Act and its Regulations? (4)

[6]**Question 2**

Compare the approaches and levels of decision-making between a Strategic Environmental Assessment (SEA) done for a proposed national policy to promote diamond mining in the southern Namibia, and an Environmental Impact Assessment (EIA) done for the construction of a tarred road leading to one of the diamond mines in the southern Namibia. (8)

[8]**Question 3**

- a) Explain the role of *public participation* ('stakeholder engagement') in an environmental impact assessment. (12)
- b) Outline the four steps that are followed when one is carrying out a waste audit and explain briefly what each step represents? (8)

[20]**Question 4**

- a) Give your opinion on the importance of *information* and *knowledge sharing* for good environmental management/practice. (4)
- b) Distinguish between *baseline monitoring*, *impacts monitoring* and *compliance monitoring*. (6)

[10]

Question 5

You want to buy a new stove and have narrowed down the options to three comparable stoves, with the following labels:



A



B



C

- a) What type of label is this? (1)
- b) What are the advantages of this type of labelling for manufacturers? (3)
- c) Which stove would you choose, if you are concerned about the environment? Justify your answer. (3)
- d) You also want to buy wooden furniture and find some with the logo of the Forestry Stewardship Council. What does this logo signify? (3)



[10]

Question 6

- a) Name seven (7) actions that Namibia must undertake to capitalize on eco-labelling? (7)
- b) The Driver-Pressure-State-Impact-Response Model (DPSIR) is a useful tool when measuring the pressures and stresses exerted on the natural resources. Using the DPSIR model construct a real-life scenario that reflect all the components of the DPSIR model. (10)

[17]

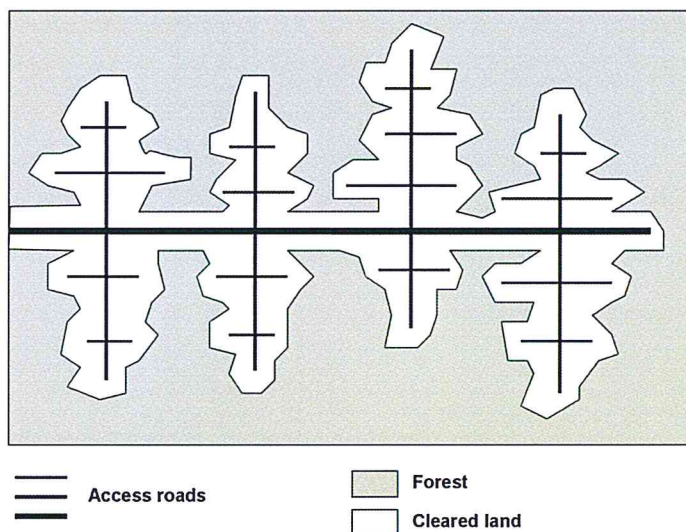
Question 7

- a) Outline each step in the life cycle of a pair of blue denim jeans, from growing the cotton until the point where you buy the jeans. (7)
- b) Describe five (3) negative environmental impacts associated with this part of the product’s life cycle. (3)
- c) Propose five (5) mitigation measures to minimise the negative environmental impacts that you have described in Q 7 (b). (5)

[15]

Question 8

Scenario: The diagram below represents a fragmented landscape in Kavango East Region, where logging (cutting of timber) has caused deforestation. You are the team leader of a restoration project.

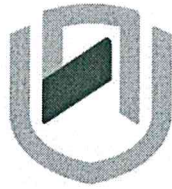


- a) Explain why *fragmentation* of any natural landscape is an ecological problem. (4)
- b) How would you go about treating the *causes* – rather than the *symptoms* – of degradation (fragmentation) in this specific case? (3)
- c) Why is it necessary to provide *linkages* in a landscape? (4)
- d) How could you achieve such linkages in practice, for this particular scenario? (3)

[14]

TOTAL: 100

**** THE END ****



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SUPPLEMENTARY / SECOND OPPORTUNITY MEMORANDUM

EXAMINER(S)	Mr. Cyrilus Tjipetekera
MODERATOR:	Dr. M. Hauptfleisch

The model answers are used as guidelines only.
The information presented by the students will be evaluated on merit.

THIS MEMORANDUM CONSISTS OF 9 PAGES (Including this front page)

Question 1

- a) What do you understand by the term Global Change? (2)
Planetary-scale changes in the earth system, natural cycles and processes and includes large-scale changes in human society. ✓✓
- b) Why do you, a future Regional and Rural Development Planner, have to study and be able to apply the Namibian Environmental Management Act and its Regulations? (4)

Must indicate understanding that economy should not be the only consideration when embarking on some development activity. The role of government (legislation & institutional support) in safeguarding the environment and ensuring sustainable development✓. Mention principles of good environmental practice✓. The legal requirement for EIAs for listed activities, and the Regulations contain the (current) listed activities✓. Mention roles of MET and Environmental Commissioner, Sustainable Development Advisory Committee, etc.) ✓.

[6]

Question 2

Compare the approaches and levels of decision-making between a Strategic Environmental Assessment (SEA) done for a proposed national policy to promote diamond mining in the southern Namibia, and an Environmental Impact Assessment (EIA) done for the construction of a tarred road leading to one of the diamond mines in the southern Namibia. (8)

Strategic Environmental Assessment:

- A formal process of systematic analysis of the environmental effects of the development legislation, policies, plans, programmes, and other proposed strategic actions (holistic view & assesses cumulative impacts). ✓
- SEA is part of a tiered approach to environmental assessment and management and operates at a higher, broader, strategic level. ✓
- It is pro-active / is done early in the decision-making process, broad and meant to advise strategically on formulation of legislation, policies and programmes when major alternative scenarios are still open. ✓
- SEA is determined by the concept of sustainability and includes the concepts of precaution and continuous (incremental) improvement. ✓
- It identifies the opportunities and constraints which the environment places on the development of plans and programmes; ✓
- It sets the criteria for levels of environmental quality or limits of acceptable changes;
- It gives early warning of potential cumulative effects; ✓
- It is a flexible process which is adaptable to the planning and sectoral development cycle; ✓
- The scope of an SEA is defined within the wider context of environmental processes; ✓

(any 4 answers above, or similar arguments)

Environmental Impact Assessment:

- An EIA is done in reaction to a development proposal; ✓
- It is an assessment of the possible positive or negative impacts that a proposed project may have on the natural, socio-economic environment. ✓
- It is a process of identifying, predicting, evaluating and mitigating the biophysical, social, and other

- relevant effects of a development proposal prior to major decisions being taken and commitments made. ✓*
- *The systematic, reproducible and interdisciplinary identification, prediction and evaluation, mitigation and management of impacts from a proposed development and its reasonable alternatives. ✓*
 - *An EIA draws together, in a systematic way, an assessment of a project's likely significant environmental, socio-economic effects. ✓*
 - *It ensures that the importance of the predicted effects, and the scope for reducing them, are properly understood by the public and the relevant competent authority before it makes its decision. ✓*
 - *It is meant to ensure that decision makers consider the ensuing environmental impacts to decide whether to proceed with a project. ✓*
 - *It considers a limited number of feasible alternatives, especially in design of the project.*
 - *It is limited in its consideration of cumulative effects.*
 - *EIA is a legislative requirement for certain activities.*
 - *It ensures practical mitigation measures.*

[8]

Question 3

- a) Explain the role of *public participation* ('stakeholder engagement') in an environmental impact assessment.

(12)

- *To allow expression of concerns about possible adverse effects. ✓*
- *To help allay fears created by lack of information. ✓*
- *To enable public to understand how conclusions have been reached. ✓*
- *To inform public on the substantive issues; allows them to form their own, informed judgments on the significance of the environmental issues. ✓*
- *To improve communication between stakeholders. ✓*
- *To raise awareness, educate and increase understanding between stakeholders; ✓*
- *To assist in identifying key issues of concern that need to be considered; ✓*
- *To raise a diversity of opinions and perspectives and obtain a balanced perspective of key issues; ✓*
- *To identify common interests and opportunities for meeting these (maximising benefits); ✓*
- *To identify sources of information and the knowledge of local and other stakeholders; ✓*
- *To learn from the knowledge and understanding of the environment of local and other stakeholders; ✓*
- *To comment on the findings of technical studies; ✓*
- *To identify reasonable alternatives; ✓*
- *To manage and minimise conflict; ✓*
- *To identify creative solutions to problems or deadlocks; ✓*
- *To inform and improve decision-making; ✓*
- *To ensure greater transparency, credibility, legitimacy and accountability in the decision-making process; ✓*
- *To establish trust and cooperation;*
- *To generate a sense of joint responsibility and ownership for the environment (and buy-in into a project); ✓*
- *To assist in the review and monitoring of activities that may negatively affect the environment; ✓*
- *To increase public confidence in the EIA process and government's commitment to sustainable development (including integrated environmental management) ✓*

- To contribute to the development of appropriate policy, legislation and regulations; ✓ and
 - To promote democracy. ✓
- [any 12 or similar, appropriate answers]

- b) Outline the four steps that are followed when one is carrying out a waste audit and explain briefly what each step represents? (8)

Student should mention the steps below or similar steps with the right facts.

Plan ✓

- Get management support and define the objectives, scope and study area of the audit.

Or

Ensure confidentiality and privacy of documents or personal information found in the waste stream. ✓

Collect ✓

- Collect the waste at the appointed time

e.g. daily at 17:00 for a whole week.

- Bags must be labelled with the date and place, and any other relevant information. Or Cleaners or waste contractors can do the collection. ✓

Sort ✓

Prepare the sorting area, e.g. tables covered with plastic; scales, buckets, bins, brooms ready; water on hand. Or

Record the locations from which each bag of waste comes; weigh the bag; empty it onto the table; sort into material categories, e.g. glass, office plastics, metal etc. ✓

Analyse ✓

The sorting will result in many data sheets showing the quantity of waste by material categories that was generated within each area sampled. / This data is entered into a database and analysed. ✓

[20]

Question 4

- a) Give your opinion on the importance of *information* and *knowledge sharing* for good environmental management. (4)

Citizens need to be empowered with environmental information ✓ and knowledge before they can be expected to voice opinions ✓, make informed choices, develop preferences ✓ and values, contribute meaningfully to discussions ✓, provide an opportunity for the sharing of indigenous knowledge. [or similar]

- b) Distinguish between *baseline monitoring*, *impacts monitoring* and *compliance monitoring*. (6)

Baseline monitoring: Measurement of environmental parameters over some time, ✓ before the project starts. Done to determine the range of variation of the system and establishing reference points against which changes can be measured. ✓

Impacts monitoring: Measurement of environmental parameters during project construction and implementation. ✓ Done to detect changes which can be attributed to the project. (To ensure that mitigation measures are implemented; To establish systems and procedures for this purpose; To monitor the effectiveness of mitigation measures; To take any necessary action when unforeseen impacts occur)

✓

Compliance monitoring: Periodic sampling or continuous measurement of environmental parameters, to ensure that regulatory requirements and standards are being met. ✓

[10]

Question 5

You want to buy a new stove and have narrowed down the options to three comparable stoves, with the following labels:



A



B



C

- a) What type of label is this? (1)

Environmental label ✓
(not ecolabel)

- b) What are the advantages of this type of labelling for manufacturers? (3)

Participation in a certification scheme ensures a certain quality of products; ✓
feedback from audits to improve operations; ✓
green reputation, with subsequent larger market share or entry into niche markets, etc. ✓

- c) Which stove would you choose, if you are concerned about the environment? Justify your answer. (3)

B. ✓
More stars in darker area shows better energy efficiency. ✓
Allows consumer to make informed decisions about cost and energy efficiency of using this appliance.
Choose most energy efficient stove. ✓

- d) You also want to buy wooden furniture and find some with the logo of the Forestry Stewardship Council. What does this logo signify?



(3)

Certifies that timber in wood-based product comes from a sustainably managed forest in compliance with internationally recognized standards. ✓
Timber is tracked throughout supply-chain to final product ('traceability'). ✓
Consumer is assured that he does not contribute to deforestation but buys sustainably harvested wood products. ✓

[10]

Question 6

- a) Name seven (7) actions that Namibia must undertake to capitalize on eco-labelling? (7)
- Adoption of credible ecolabels✓
 - Development of local ecolabels✓
 - Capacity building✓
 - Education and awareness✓
 - Research✓
 - Mainstreaming SMEs✓
 - 'Geographic Indications'✓
 - *Explore geographical branding strategies for Namibian indigenous natural products such as !Nara oil, Devils Claw and Swakara pelts.*
- b) The Driver-Pressure-State-Impact-Response Model (DPSIR) is a useful tool when measuring the pressures and stresses exerted on the natural resources. Using the DPSIR model construct a real-life scenario that reflects all the components of the DPSIR model. (10)
- *Driving forces – human influences and activities that, when combined with environmental conditions, underpin environmental change. ✓ (Not enough land for grazing) ✓*
 - *Pressures – these are exerted on resources and ecosystems as a result of human activities. ✓ (Overstocking too many livestock) ✓*
 - *State– the condition of the environment resulting from driving forces and pressures. ✓ (overgrazed/ no fodder) ✓*
 - *Impacts– the consequences or results of pressures on the current state of the environment. ✓ (Rangeland degradation & soil erosion) & (livestock death & poverty) ✓*
 - *Responses – the societal actions taken collectively or individually to ease or prevent. negative environmental impacts correct environmental damage or conserve natural resources. ✓ (Sell livestock or buy more land) ✓*

[17]

Question 7

a) Outline each step in the life cycle of a pair of blue denim jeans, from growing the cotton until the point where you buy the jeans. (7)

- *Grow cotton & Harvest cotton*✓
- *Transport to cotton gin*✓
- *Spin, Colour & Weave into fabric*✓
- *Transport fabric to clothing factory*✓
- *Manufacture (sew) jeans*✓
- *Package the finish product*✓
- *Transport (several stages, via warehouses etc.) to shop*✓

b) Describe five (3) negative environmental impacts associated with this part of the product's life cycle. (3)

Any five facts

- *Growing cotton uses large amounts of water*✓
- *Pesticides & herbicides are detrimental to soil & natural vegetation*✓
- *Excess fertilizer is detrimental to soil & water (eutrophication)* ✓
- *CO₂ contributes to climate change*✓
- *Particulates & other air pollutants are harmful to living organisms*✓
- *Synthetic dyes are toxic, harmful to aquatic and soil organisms*✓

c) Propose five (5) mitigation measures to minimise the negative environmental impacts that you have described in Q 7 (b). (5)

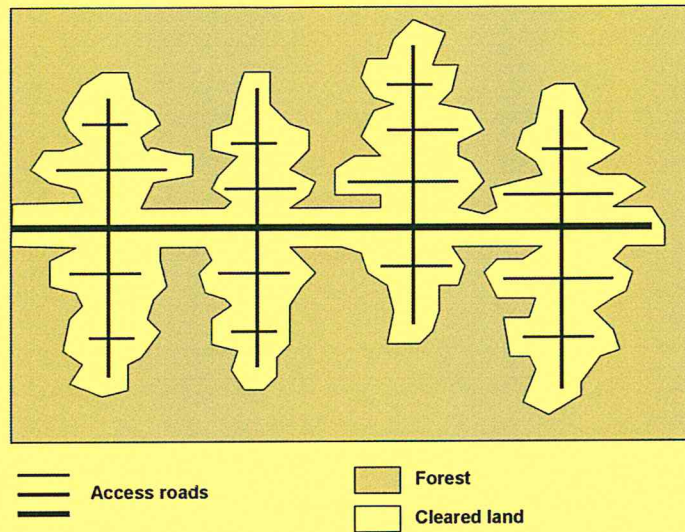
Any five facts

- *Use agrochemicals sparingly and carefully.* ✓
- *Prevent runoff into streams.* ✓
- *Shorten transport routes by using locally grown cotton,* ✓
- *Set up processing and manufacturing plant as close as possible to source and destination of product.* ✓
- *Use electricity generated from renewable resources.* ✓
- *Use natural and less toxic dyes.* ✓

[15]

Question 8

Scenario: The diagram below represents a fragmented landscape in Kavango East Region, where logging (cutting of timber) has caused deforestation. You are the team leader of a restoration project.



- a) Explain why *fragmentation* of any natural landscape is an ecological problem. (4)

Student needs to demonstrate an understanding that:

- Too small landscape parcels cannot fulfill all the necessary ecosystem functions / processes, such as hydrological & nutrient cycling, vegetation development, modifying the microclimate, producing shade and humus etc. ✓
- He/she has to say something about too small habitats inability to retain resources (water, nutrients, soil, organic matter,) ✓
- Small patches can be 'leaky', are dominated by their context / neighbourhood and can be more easily invaded by undesirable species, loses biodiversity more easily. ✓
- Size and shape of boundaries of patches can affect the rate and direction of successional processes. Lack of corridors / linkages for movement of organisms. ✓

- b) How would you go about treating the *causes* – rather than the symptoms – of degradation (fragmentation) in this specific case? (3)

- Stop logging / stop clearing of land ✓
- Penalties (through legislation) ✓
- Incentives ✓
- Provide alternative livelihoods / development opportunities, ✓
- Awareness creation, education ✓

- (c) Why is it necessary to provide *linkages* in a landscape? (4)

Linkages are important for species migration and dispersal because:

- Species vary in their mobility / ability to disperse easily from their origins. ✓
- Human infrastructure, such as roads, and cleared land form barriers to the movement of animals. ✓
- Dispersal is important for various evolutionary processes. ✓
- Without linkages, organisms may be trapped and be faced with hardships / population decline / local extinction when environmental conditions become unbearable. ✓

- (d) How could you achieve such linkages in practice, for this particular scenario? (3)
- Remove cause (logging); break up roads; ✓*
ensure enough ground cover and organic material to provide microhabitats for seedlings; plant some local (woody) species; ✓
allow forbs and grasses from surrounding forest to expand into cleared areas; monitor progress.... ✓

[15]

TOTAL: 100

**** THE END ****