


Module 13: Risk Mitigation and Adaptation in Extension and Advisory Services



WORKBOOK

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Module 13: Risk Mitigation and Adaptation in Extension and Advisory Services

Pre-assessment

After reading through the module overview and introduction complete the following pre-assessment in order to determine how comfortable you are with the topic of risk management and adaption in extension. Rate your knowledge on the topics on a scale of 1 to 5 by circling the corresponding number.

	Question	Self-assessment				
		Low		High		
1	Are you familiar with the concepts risk and uncertainty?	1	2	3	4	5
2	How confident are you in your ability to identify factors that influence risk perception?	1	2	3	4	5
3	Are you able to identify, measure and evaluate risk?	1	2	3	4	5
4	Are you familiar with the concept of climate, weather, climate change and extreme events?	1	2	3	4	5
5	How confident are you in your ability to explain the link between climate change and agriculture?	1	2	3	4	5
6	How confident are you in your ability to explain the relationship between climate change and socio-economics?	1	2	3	4	5
7	Are you able to explain how climate change affects the health of rural communities?	1	2	3	4	5

	Question	Self-assessment				
		Low			High	
8	Are you able to list the steps needed to plan for and implement adaptation approaches?	1	2	3	4	5
9	Are you able to explain the role of EAS in mitigating risk and uncertainty?	1	2	3	4	5
10	How comfortable are you with explaining the role of climate and market forecasts?	1	2	3	4	5
11	Are you able to outline examples of best practices in risk mitigation?	1	2	3	4	5
12	Are you familiar with tools used in adaptation and risk managements?	1	2	3	4	5
13	How comfortable are you with resilience tools?	1	2	3	4	5
14	Are you able to use climate and socio-economic forecast tools for risk management?	1	2	3	4	5
15	How confident are you in your data collection skills and the visual presentation of collected data?	1	2	3	4	5

Study unit 1: Introduction to risk and risk management

Session 1.1: Understanding risk and uncertainty

Activity 1.1 Individual activity: Risk and uncertainty

Read through the case study below and answer the question that follows.

Imagine that a farmer has two routes to the market; the quickest route being over rough terrain and the longer route being on well-maintained roads and likelihood of traffic congestion. The shorter route will get him to the market before the other vendors, allowing him to increase his sales, but there is the risk that his wagon will not be able to make the journey.

The farmer now needs to consider the following:

- The shorter path has a higher uncertainty as to whether he will make it to the market but the positive outcome of increasing his sales if he takes the risk; and
- The longer route has a lower uncertainty that he will make it to the market but carries the risk that he will sell less.

What would you do if you were in the farmer's position?

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Activity 1.3 Individual activity: Measuring uncertainty and risk

Read through the scenario below and answer the questions that follow.

Looking at the routes to market example in Activity 1.1, the farmer finds out from his neighbour that the short path was travelled safely in the last month but recent rains may have affected the route. You can now assume a 'possible' uncertainty and assume the outcome as being 'severe' due to the fact that not making it will result in no sales. For the short path a negative outcome is 'very unlikely' and a negative outcome is 'negligible'. You can now rank the risk of the two options and see that although the farmer could increase his profits, the risk is high and he would be safer taking the short path.

Consider the following changes to the above case and determine the risk for each. Which route would you suggest based on your analysis?

1. The farmer finds out that someone safely travelled the short route the previous day. Assume that the long route conditions remain the same. (2)

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2. The long route is undergoing road maintenance, which may result in delays and have a moderate effect on profits. Assume the short route is as stated in question 1. (2)

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Total: 4 marks

Session 1.2: Risk perception and human behaviour

Activity 1.4 Individual activity: Risk perception

Answer the following questions in your own words. Write your answer in the space provided

1. Is the following true or false? If false, correct the statement.

- a. Experts in the field of risk will share the same views on what constitutes a risk and the level of the risk. (2)

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- b. Human behaviour is an important factor in risk perception. (2)

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- c. Aggregate data can be used to determine the specific risks faced by rural farmers. (2)

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- d. Aggregate data can be used to study trends which can assist in managing the risks faced by rural farmers. (2)

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e. Statistical data allows for the elimination of individual risk perception but also carries the risk of misinterpretation. (2)

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f. The key to successful risk management is the use of individual risk perception. (2)

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Total: 12 marks

Session 1.3: Risk identification, measurement, analysis and evaluation

Activity 1.5 Individual activity: Flash floods example 1

Two farmers are farming in a low-lying area. Farmer A has seedlings in his field and farmer B has mature crops that are almost ready for harvest. Heavy rains have been reported upstream of the river and there is a good chance of flash floods. Both farmers are dependent on their crops as their only source of income. Use a risk assessment matrix to determine the risk for both farmers for the cases in which:

1. No crops are lost but the soil is flooded. (3)

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2. The position of farmer A's farm means it is unlikely to be hit by the flood. (2)

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3. Farmer B's house is in the path of the flash flood. (3)

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Total: 8 marks

Activity 1.6 Individual activity: Flash Floods example 2

The following risk assessment matrix has been set up based on the location of farms in relation to the valley floor. The damage from flooding is directly related to the location of farms relative to this point.

1. Complete the matrix below by considering the following information from previous flash floods:
 - Flash floods are common at farms located at elevations below 5 m;
 - Elevations above 7 m have very little risk of being affected by flash floods;
 - Structural damage occurs on farms below 3 m, with minor damage reported at up to 4 m;
 - Loss of life has only been recorded for farms on the valley floor, with the exception of a single flash flood in 2012 which claimed the life of 3 farmers at an elevation of 2 m, in this instance; and
 - Flooding which affects crop development has been noted in farms below 5 m.

Negligible		Outcome				
		Minor	Moderate	Major	Severe	
Elevation	8 m					
	6 m					
	5 m					
	4 m					
	3 m					
	2 m					
	Valley floor					

Total: 35 marks

Summative assessment: Unit 1

Answer the following questions in your own words. Write your answer in the space provided

1. Name the factors that will affect your ability to identify and evaluate risks. (3)

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2. Define risk in terms of uncertainty. (3)

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3. Discuss how the principle of supply and demand can expose farmers to risks. Use an example in your discussion. (3)

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4. What factors should be considered when using statistical data in risk management? (3)

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5. Is the following true or false? If false, correct the statement.
Write your answer in the space provided.

a. Risk evaluation is the process of identifying the risks which need to be mitigated. (2)

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b. Your personal understanding of risk can affect your ability to correctly assess risk. (2)

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c. Risk assessment by individuals is only possible by risk experts. (2)

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d. Risk matrixes can be used to measure risks caused by hazards and exposure. (2)

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e. You can perform a risk assessment as long as you know the severity of the risk. (2)

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Study unit 2: Understanding adaptation in the context of climate change

Session 2.1: Understanding climate science

Activity 2.1 Individual activity: Climate science

1. Explain the following terms. Write your answer in the space provided (10)

Term	Description
1. Climate
2. Weather

Term	Description
3. Extreme event
4. Vulnerability
5. Persistence

Total: 10 marks

Session 2.2: Climate change and agriculture

Activity 2.2 Individual activity: Adaptation challenges

1. Indicate whether the following statements are true or false. Provide a reason if false. Write your answer in the space provided. (10)

- a. Small changes of 1–2°C in global average temperature will not result in any noticeable effects

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- b. There's currently no evidence that global warming is occurring

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- c. Global warming refers to the increase in atmospheric temperatures due to the trapping of the sun's rays by greenhouse gases.

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- d. Current predictions for sea level, temperature and carbon dioxide increases for 2050 are of low confidence

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e. Global warming suggests that temperatures will increase equally across the globe.

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Total: 10 marks

Session 2.3: Climate change and socio-economics

Activity 2.3 Individual activity: Group participation

1. Draw a line connecting the terms/statements in column A to those in column B that best match said term or statement. (5)

Term	Description
1. Social capital	A. The money a farmer has available to purchases seeds
2. Physical capital	B. A group of farmers that work together to share information
3. Human capital	C. A farmer's tools
4. Financial capital	D. The type of soil and water available to local farmers
5. Natural capital	E. A farmer's experience planting a specific crop

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Total: 5 marks

Summative assessment: Unit 2

Answer the following questions in your own words. Write your answer in the space provided.

1. Describe the difference between weather and climate. (2)

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2. Describe the difference between adaptive and reactive adaptation. (2)

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3. Provide an example of a long term and short term extreme event. (2)

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4. What are the two types of adaptation challenges? (3)

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5. Name the five types of capital related to climate change. (5)

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6. Is the following true or false? If false, correct the statement. (10)

a. Financial capital includes the tools and buildings owned by individuals.

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b. Increases in temperature due to climate change can result in favourable conditions for malaria carrying mosquitos.

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c. The magnitude of an event determines how likely it is to occur.

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d. Climate change and variation have the same meaning.

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e. Adaptive capacity is the ability of groups to adapt to climate change.

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7. List the vulnerabilities farmers are exposed to in areas with high risks of flooding. (4)

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8. Name at least four atmospheric/climate components that will be affected by an increase in average global temperatures. (4)

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Total: 32 marks

Summative assessment: Unit 3

Answer the following questions in your own words.

1. Complete the following table by filling in the missing adaptation strategies. You only have to include two strategies for each event. Write your answer in the space provided. (8)

Extreme event	Adaptation strategy
Heat waves
Adaptation to drought
Flooding
Wildfires (often noted during heat waves)

2. Fill in the missing sections in the following list of successful adaptation strategies. Write your answer in the space provided. (5)

- Adoption of water and energy ...2.1... practices
- Developing local market systems
 - Improving market ...2.2... and the understanding of how markets operate
 - This creates a more transparent market environment to assist farmers in understanding the ...2.3... of their crops
- ...2.4... approaches/training
 - To increase efficient use of available resources
 - To assist farmers in increasing ...2.5... through new farming practices and crop types (crop diversification), in order to improve resistance to crop price fluctuation

2.1

2.2

2.3

2.4

2.5

Total: 13 marks

Summative assessment: Group project

Complete this assessment in groups of three or four.

1. In order to test the skills gained in this module you will be required to select a region from a list provided by your lecturer or one you have identified yourself. You will be required to:
 - Gather climate and socio-economic data on the selected region;
 - Identify risks faced by communities in the region;
 - Identify current adaptation and risk management strategies in place;
 - Suggest additional adaptation and risk management strategies; and
 - Present your findings to the rest of the class.

Requirements:

- You will need to apply risk management and adaptation strategies discussed in this course;
- Make use of toolkits
- Be able to gather data from reputable sources such as those included in this module; and
- Communicate the data effectively to the rest of the class using visualisation tools.

Total: 40 marks

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Post-assessment

Complete the following pre-assessment in order to determine how much you have learnt on the topic of gender in extension.

	Question	Self-assessment				
		Low				High
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6	How confident are you in your ability to explain the relationship between climate change and socio-economics?	1	2	3	4	5
7	Are you able to explain how climate change affects the health of rural communities?	1	2	3	4	5
8	Are you able to list the steps needed to plan for and implement adaptation approaches?	1	2	3	4	5
9	Are you able to explain the role of EAS in mitigating risk and uncertainty?	1	2	3	4	5

	Question	Self-assessment				
		Low		High		
10	How comfortable are you with explaining the role of climate and market forecasts?	1	2	3	4	5
11	Are you able to outline examples of best practices in risk mitigation?	1	2	3	4	5
12	Are you familiar with tools used in adaptation and risk managements?	1	2	3	4	5
13	How comfortable are you with resilience tools?	1	2	3	4	5
14	Are you able to use climate and socio-economic forecast tools for risk management?	1	2	3	4	5
15	How confident are you in your data collection skills and the visual presentation of collected data?	1	2	3	4	5