



“Investing in Africa’s future”

COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES

NAEC202/ AEC202: AGRICULTURAL EDUCATION AND EXTENSION

END OF SECOND SEMESTER FINAL EXAMINATIONS

MAY/JUNE 2020

LECTURER: DR. K. MUKUMBI

DURATION: 48 HRS

INSTRUCTION

Choose and Answer **ONE** question Only

All Questions Carry Equal Marks (100)

QUESTION 1

Read the passage below and answer the questions that follow.

'Neglected and underutilized', 'minor' or 'promising' crops, orphan crops have been overlooked by research, extension services and policy makers. Governments rarely allocate resources for their promotion and development. That results in farmers planting them less often, reduced access to high quality seeds, and loss of traditional knowledge. Examples of neglected and underutilized crops include -Bambara groundnut (*Vigna subterranea*) Moringa (*Moringa oleifera*), African eggplant (*Solanum aethiopicum*), leaf amaranth (*Amaranthus* spp.), yams (*Dioscorea* spp.), tef (*Eragrostis tef*), and finger millet (*Eleusine coracana*).

Neglected and underutilized species (NUS) have been overshadowed by those in greater demand. Of the 30,000 edible plant species, a mere 30 are used to feed the world. Yet these neglected and underutilized crops can help to increase the diversification of food production, adding new species to our diets that can result in better supply of particular nutrients, i.e. essential amino acids, fiber, proteins.

In addition to diversifying nutritional intake, neglected and underutilized crops provide economic and environmental benefits. Farmers can grow them on their own, as part of crop rotation systems or inter-plant them with other crops, protecting and enhancing agro-biodiversity at the field level. Having a bigger number of species to choose in a crop rotation system allows farmers to have a more sustainable production system. By changing species in a crop rotation system the cycle of some pests and diseases is disrupted and probabilities of infestations are reduced.

The neglect of NUS and failure to use them fully stems from a lack of awareness of their economic and nutritional value. Researchers, farmers, consumers and policymakers focus on the major commodity crops. Public awareness campaigns, better information and training can help farmers and consumers realize the benefits NUS can bring and can encourage scientists and policymakers to optimize and promote these benefits.

- a) You have been asked to develop a communication strategy that changes the perceptions of neglected and underutilized species as unimportant 'poor man's food' among farmers, researchers, policymakers and consumers. Your response should answer the following questions:
- i. What types of stakeholders should be involved? (5)
 - ii. What is the desired change in behavior? (4)
 - iii. What three key messages would be appropriate? (6)
 - iv. Which media of communication would be most effective? (3), and Why? (2)

v. Which extension methods should be used to promote knowledge on the NUS to farmers? Justify each method you recommend. (5)

b) The Ministry of Agriculture of an African country would like to promote production, processing and consumption of one Neglected and Underutilized species - tef.

i. Which extension approach is the most appropriate one to use in each of these situations? Describe the extension approach and explain why you chose it. (10)

ii. Which extension model is the most appropriate one to use in each of these situations? Describe the extension model and explain why you chose it. (10)

iii. Which extension methods are the most appropriate one to use in each of these situations? Describe the extension methods and explain why you chose them. (10)

c) *Read the passage below and answer the questions that follow*

Globally, 20% of cropland is irrigated, but only 5% of cropland is irrigated in Africa; and yet Africa has the greatest food insecurity, partly due to unreliable growing seasons. There is an abundance of sunlight, African countries can greatly benefit from solar energy to make use of groundwater resources. There is an increasing demand for irrigation due to the need for higher food production for a rising world population and decreasing supplies of freshwater in the context of a changing climate. High diesel and electricity costs and often unreliable energy services affect the pumping requirements for irrigation for small and large farmers. In many rural areas, grid electricity is not, or is only sporadically, available. Using solar energy for irrigation water pumping is a promising alternative to conventional electricity and diesel-based pumping systems. Solar water pumping is based on photovoltaic (PV) technology, which converts solar energy into electrical energy to run a direct current (DC) or alternating current (AC) motor-based water pump.

i. Describe five factors that could affect adoption of solar powered irrigation systems by farmers? (15)

ii. As an extension agent, how would you apply knowledge on the 5 categories of adopters in promoting powered irrigation systems to farmers? (10)

d) You have been hired as a extension officer for a seed company after graduation. Your first task is to incorporate ICT into extension activities.

i. Describe steps you would take, resources you would use, and specific activities that would be conducted using ICT. (10)

ii. Explain why you chose those specific steps, resources and activities in (i). (10)

End Of Question 1

QUESTION 2

Read the passage below and answer the questions that follow.

The uptake of agricultural insurance by Zimbabwean farmers is low as most of the farmers are from a subsistence background that does not have a culture of using insurance as a risk management tool. Farmers are encouraged to take up agricultural insurance as a measure to minimize risks caused by climate change and theft.

EcoFarmer is Econet's own mobile farming platform. EcoFarmer was launched in 2013 as a weather indexed insurance business. Following launch, EcoFarmer enabled farmers to insure their crops against the risk of false rainfall, excessive rainfall and excessive dry days for as little as USD\$2.50 per year for \$25 worth of cover. The cover was available for maize. Insured farmers also received free maize advisory tips and market information. This service was popular with smallholder farmers, although improvement areas were identified.

A research on customer needs in conjunction with our partners in 2015, using human centered design, allowed the business to identify other needs that the service was not addressing. As a result, the services offered are being expanded to include information, financial and value chain services that will be offered by EcoFarmer in conjunction with various Econet units or other external strategic partners. These services will be provided to small scale-farmers, large-scale farmers, farmer organisations as well as industry at large.

- a) You have been hired by Ecofarmer as a consultant. You have been asked to develop a communication strategy that promotes use of Ecofarmer services – insurance, financial, information via their mobile phones. Your response should answer the following questions:
- i. What types of stakeholders should be involved? (5)
 - ii. What is the desired change in behavior? (4)
 - iii. What three key messages would be appropriate? (6)
 - iv. Which media of communication would be most effective? (3) Why? (2)
 - v. How will the communication process be monitored and evaluated? (5)
- b) Over the past half a century developing regions, with the exception of Sub-Saharan Africa, have seen labor-saving technologies adopted at unprecedented levels. Sub-Saharan Africa continues to have very low levels of mechanization and available data indicate declining rather than increasing levels of adoption, even among the countries that were the early trendsetters, such as Kenya and Zimbabwe.
- a) What could be causing the low and declining levels of mechanization in Sub-Saharan Africa? (15)
 - b) As an extension agent, how would you apply knowledge on the diffusion of innovation theory in promoting mechanization to farmers? (10)

c) Which extension approach is the most appropriate one to use in each of these situations? Justify your choice.

- i. Africa University Department of Agriculture and Natural Sciences decides to provide extension services to farmers in Manicaland Province. (5)
- ii. A fertilizer company provides extension and advisory services to a farmers' cooperative. (5)
- iii. Dairibord Zimbabwe provides extension and advisory support services to its suppliers in the areas of milk production, research, input supply and marketing. (5)
- iv. The Ministry of Agriculture in your home country would like to see an improvement in the production (quality and quantity) from small scale farmers. They would also like to see increased food security, employment for youths, conservation and rural development. (5)
- v. A group of farmers approaches a local NGO with areas they would like training in. (5)

d) An agrochemical expert trains the local government extension officers on how to control the fall armyworm. The extension officers in turn train 10 of the top farmers in their province, who in turn train other farmers in their district. However by the time the information gets to the last farmer in the village it is very different from what the agrochemical expert had suggested and as a result crops are damaged from the wrong application of chemicals and some farmers fall ill.

- a) What could have caused the distortion in information on controlling the fall armyworm in this case? (15)
- b) What can the agrochemical expert and extension officers do to ensure that the problem does not occur again in the future? (10)

End Of Question 2

QUESTION 3

- a) Taking into account your area of specialization e.g. Agribusiness or Horticulture etc,
- i. Which skills, technologies, and knowledge are needed by smallholder farmers in your home country? Explain why you think those skills, technologies and knowledge are necessary. Your response should be in essay format with paragraphs and subheadings. (30)
 - ii. Which four extension approaches would be the most appropriate for use in

your home country? Explain. (20)

ii. Recommend innovative ways of educating the small holder farmers that go beyond the traditional ways of communicating with the farmers. (15)

b) Despite the benefits of using drip irrigation. There has been low uptake of drip irrigation among smallholder farmers in Zimbabwe even when given the drip kits for free by NGOs.

i. What factors could be influencing adoption of drip irrigation among smallholder farmers? (20)

ii. How would you apply knowledge on Diffusion of Innovations theory to your work as an advisory and extension agent? (15)

End Of Question 3