A Logit analysis of farmer' knowledge and management of African white rice stem borer, *Maliarpha separatella* Rag at Mwea irrigation scheme, Kirinyaga County, Central Province, Kenya

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Introduction.

- Rice - third most important cereal crop after maize and wheat in Kenya

- Of the three grain staples, has the highest per capita consumption.

- *Maliarpha separatella* which is a major rice pest- major constraint to production

Introduction..

- In order to develop viable pest management practices for *M. separatella* we need to understand rice farmers' knowledge, attitude and practice(KAP) of the pest.

- Many studies report that farmer knowledge is important to smallholder farmers' decision making (Belaineh, 2003).

- Social demographic factors-, age, religious beliefs, myths, experience and education-

affects acquisition, application and retention information (Belaineh 2003).

- Positive correlation exist between knowledge-score and attitude-score (Mahdi *et al.* (2006)
- Interpersonal sources- friends and neighbours are important in distribution of agricultural information in farming communities (Belaineh, 2003)

Objectives

- To investigate and to document farmers' knowledge and management of the African white rice stem borer *Maliarpha separatella* at Mwea irrigation scheme.
- Research questions

What is the level of farmers knowledge of the African white rice stem borer *Maliarpha separatella* and the influence this has on and its management at Mwea irrigation scheme.

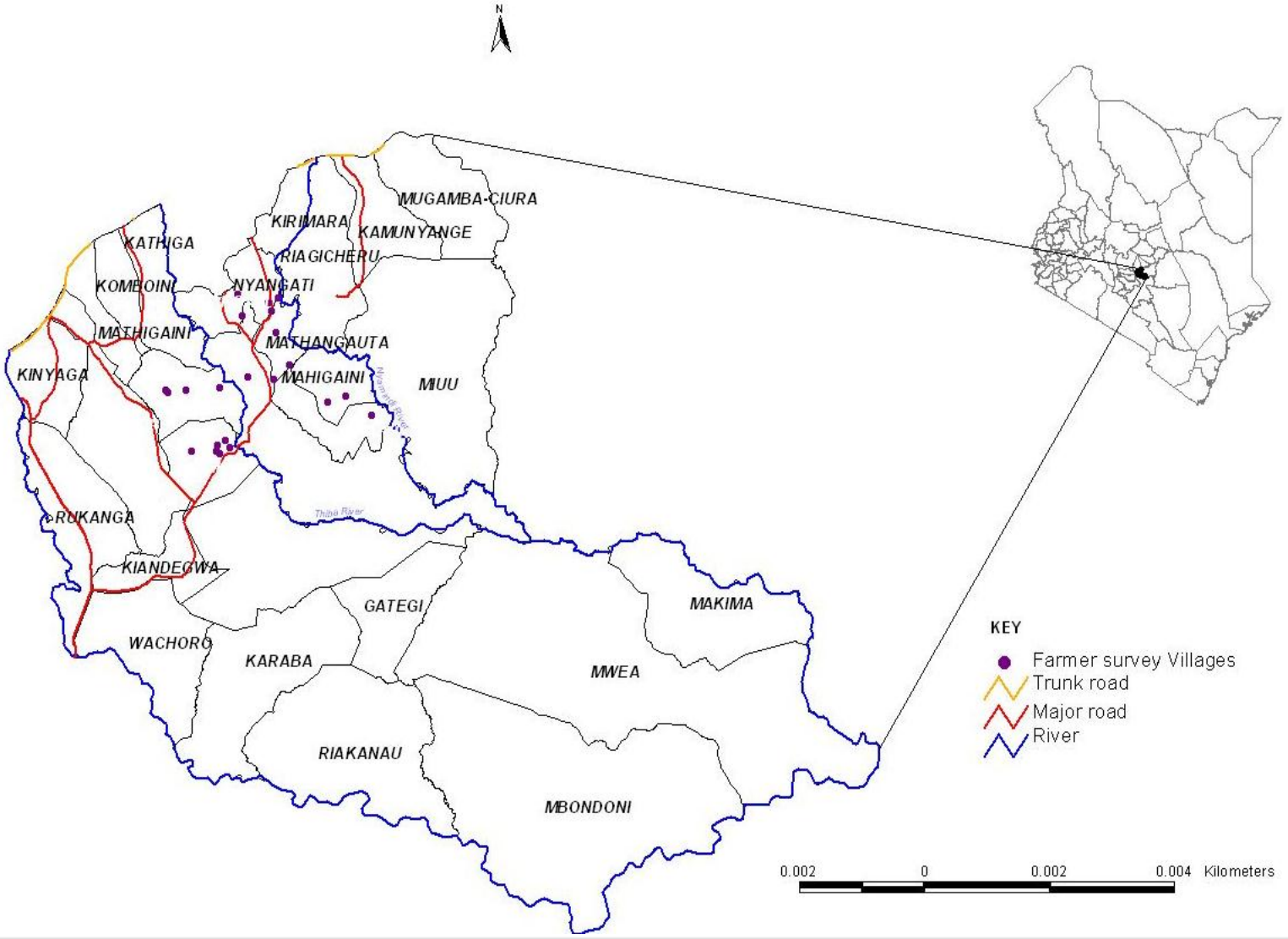
Methodology.

- Study site- Mwea rice irrigation scheme (0º 40'S; 37º 18'E) which is in Kirinyaga County, Central Province, Kenya.
- Multistage random sampling
- Scheme- 9,226 households settled in 70 communal villages (Mwangi, 2011).
- These villages were distributed in 13 sub locations within nine locations in Mwea division.
- List of 17 villages was drawn from the 70 villages

Methodology

- All the respondent villages had their latitudinal and longitudinal positions as well as altitude determined with the help of a Garmin® e-trex hand held monochrome Geographic Positioning System (GPS) device

- Geographic information System (GIS) coordinate digital map linked software (Arc GIS) was used to map the villages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Methodology..

- From each village, seven homesteads were selected making a total of 119 households.
- A formal questionnaire was administered to heads of these households to gather information on level of farmers' knowledge of *M. separatella*.
- Survey data- subjected to descriptive statistics and logit analysis by use of SPSS version 16 statistical software

Results

- The *apriori* expectation was that eight variables will affect farmer knowledge on *M. separatella* in different but specific ways. These variables were age, gender**,** education, training**,** rice farming experience**, s**ources of information, type of information and occupation (Table 1).

Table 1: Determinants of *M. separatella* knowledge at M.I.S in February 2011

Variable	Description
AGE	Age of the respondent, years
GENDER	Gender of respondent, 1 Male, 0 Female
EDU	Years of formal schooling
TRAIN	Attended agricultural training, 0 Yes 1 No

RICE EXP Rice farming experience, 0 Yes 1 No

INFO_SOR Source of information about *M. separatella,* 1 extension services, 0 otherwise

INFO_TYPE Information on *M. separatella* ,0 Yes 1 Otherwise

OCCU Occupation, 0 Rice farming alone ,1 Otherwise

BORER_KNO Knowledge of *M. separatella*, 0 Yes, 1 No

Results cont.

- The variables; age (p=0.05), rice farming experience (p=0.00) and rice farming as the only occupation (p=0.00), had a positive significant influence on *M. separatella* knowledge and
- Being a female (p=0.04) significantly increased the probability of not having *M. separatella* knowledge
- Contrary to *apriori* expectation, education (p=0.78), training (p=0.47), information sources (p=0.56) and information type (p=0.60), were found not to have any significant influence on *M. separatella* knowledge. (Table 2).

Table 2: *M. separatella* knowledge determinants

Variable	B	S.E.	Wald	df	Sign (p-value)	Exp(B)
AGE	0.04	0.01	7.91	1	0.005	0.96
GENDER	-0.94	0.33	8.12	1	0.004	0.39
OCCU	2.23	0.56	15.83	1	0.000	9.30
RICE EXP	0.11	0.02	25.26	1	0.000	0.90
Constant	2.72	0.80	11.42	1	0.001	15.13

-2log likelihood=380.00, *chi-square*= 84.11, probability *(chi-square)* = 0.00, *Nagerkeke* R^2=0.30

- 95.6% of respondents felt that losses of >90% would occur if the pest was not controlled

Expected monetary loss	Frequency	Valid Percent
100%	23	39.0
90%	34	57.6
No loss	2	3.4

- Main control method was pesticide spraying

Pesticide trade name	Chemical name	Compound group	Percent
Alpha®	Alpha-cyhalothrin	Pyrethroid	24%
Dimethoate®	Dimethoate	Organophosphorous	24%,
Diazinon®	Diazinon	Organophosphorous	6%
	Fenitrothion	Organopho	23%

- Occupation and capital sources for rice cultivation influenced control decisions

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
HHoccupation	Sborer_symptoms	2.658	7	0.38	2.839	0.011
	Sborer_myth	0.019	7	0.003	0.248	0.971
Capital	Sborer_symptoms	1.27	4	0.317	2.374	0.06
	Sborer_myth	0.164	4	0.041	3.824	0.007

Conclusions and recommendations

- From the above results it is apparent that communal affiliations at Mwea irrigation scheme are more important factors in dissemination of *M. separatella* knowledge than age or education.
- Farmers spray against *M.separatella* more for risk aversion than on a need basis
- Therefore, it is recommended that attempts to disseminate *M. separatella* knowledge and management exploit the communal affiliations in the scheme and structure extension messages in a way that will address gender and the disparities in age and education.

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- Farmers
- Audience