*Journal of Crop and Weed, **9**(1):56-68(2013)*

Analysing and ensuring persuasive extension with respect to preventive innovation for sustainable agriculture

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Received: 04-5-2013, Revised: 25-5-2013, Accepted: 30-5-2013

ABSTRACT

In the changed agricultural scenario, as concerns about environmental protection, natural resource stewardship, and the India's ability to feed ever-growing populations continue to mount, the sustainability of agriculture and natural resources is emerging as a central theme among the public and policymakers alike. Increased environmental awareness and health consciousness promoted the scientists and planners to think and promote an alternate pathway of extension science for sustainable agriculture with protection to environment and human health, called persuasive extension. Consequently, the present study was conducted with an aim to highlight the issues of persuasive extension and assess the knowledge practice gap associated with the preventive innovation in agriculture. Data collected from 100 respondents with the help of structured interview schedule followed by statistical analyses revealed that among the three groups of farmers (good, moderate, not so good) good farmers had more knowledge about preventive innovation due to their superior characteristics (more experience, publication reading habit, more land holding etc.) than other two groups of farmers, they also followed these practices related to preventive innovation.

Keywords: Knowledge gap, persuasive extension, preventive innovation, sustainable agriculture

As an aftermath of green revolution supported by advanced agricultural sciences, the increased gulf between production and an understanding of basic ecological relationship has coincided with the increased use of external inputs, development of crop species with low susceptibility to pests, dependency on large amounts of water and other scarce natural resources which have extremely contributed to degradation of environment and sustainable agricultural system, production of unsafe food and ultimately deterioration of human and animal health. As concerns about environmental protection, natural resource stewardship, and the India's ability to feed ever-growing populations continue to mount, the sustainability of agriculture and natural resources is emerging as a central theme among the public and policymakers alike. The deepening awareness of the interdependence of agriculture, the environment, and socioeconomic conditions has called into question the sustainability of current agricultural production systems. Increased environmental awareness and health consciousness promoted the scientists and planners to think and promote an alternate pathway of extension education programme for sustainable agriculture with protection to environment and human health, called persuasive extension programme. Persuasive extension helps farmers to generate preventive behaviour in them and to motivate them to adopt preventive innovation (Röling, 1990). The main aim of persuasive extension is introduction of preventive innovation. Preventive innovation is an idea that an individual adopts at one point in time in order to lower the probability that some future unwanted event may occur (Rogers, 2003). Persuasive extension assumes that there is an established correct way of doing things and that the role of the extension officer is simply to present the new knowledge (techniques, processes, skills etc.) in a manner that ensures the farmer or land manager adopts them more or less unquestioningly (Coutts *et. al.*, 2005).

In such a resilient research climate the present paper has envisaged to identify and document the issues of persuasive extension in terms of preventive innovation in the field of agriculture and to assess the knowledge practice gap of preventive innovation, present in different categories of farmers in the study area.

MATERIALS AND METHODS

The present study was conducted in Bhabanipur village of Fatehpur gram panchayat in Haringhata block of Nadia district of West Bengal, India during the year 2012. District Nadia was selected purposively. For selection of block, gram panchayat and village multistage random sampling technique was adopted and for selection of respondents complete enumeration technique was carried out to identify 100 respondents for present study. The data were collected with the help of pretested structured interview schedule through personal interview method. The data were processed into frequency, percentage, chi-square test and fisher exact test (FET) to draw the conclusion. The farmers were categorised into three groups *viz*., 'good', 'moderate' and 'not so good' on the basis of the nine identified attributes namely age, education, experience, land holding, linkage, publication reading

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habit, disease pest diagnostic ability, interest in new innovation, dose determining ability. The conclusion related to persuasive extension was drawn on the basis of the fifty six identified preventive innovations in crop production and forty three identified preventive innovations in soil management derived with the help of the experts' opinion.

RESULTS AND DISCUSSION

Association between different categories of farmers in respect of their knowledge about preventive innovation and knowledge practice gap

To determine this association at first 99 preventive innovations were listed in 2 categories-

1. Crop production (56 items)
2. Soil management (43 items)

Crop production

1. Crop should not be selected without selecting the location of field.
2. Seed should not be transplanted without seed treatment.
3. Proper sequence in the method of cultivation like weed control followed by ploughing, fertilizer application, irrigation etc. should not break.
4. Fertilizer should not be applied before weed control.
5. In case of rice cultivation, full dose of nitrogen should not be applied as basal.
6. In case of rice cultivation, without taking care of seed bed, much attention should not give only for main field preparation.
7. Seed should not be transplanted without knowing the seed rate.
8. Variety of any crop should not be selected without knowing the location of the field.
9. Full dose of nitrogen should not only be applied as basal but also as topdressing for the growth of the plant.
10. Full dose of Nitrogen should not only be applied as basal but also as topdressing in water stagnation period.
11. Irrigation should not be applied within 2 days of puddling.
12. Rice seedling should not be transplanted without proper spacing.
13. Boro rice should not be transplanted without knowing the ground water level.
14. In case of Aus rice, variety with late maturity (more than 70-150 days) should not be selected.
15. Wheat should not be sown in December.
16. Wheat should not be sown in high and low land.
17. Irrigation should be given in wheat field 20-22 days after transplanting.
18. Jute should be harvested before 120 days.
19. Jute should not be harvested in much mature condition.
20. Retting in jute should not be done with banana stem and mud.
21. Without controlling Hairy caterpillar jute should not be cultivated.
22. Sesamum should not be cultivated without proper care.
23. If adequate sulphur is not available, sesamum should not be cultivated.
24. In case of sesamum cultivation, Urea and DAP should not be used as source of N and P.
25. 40-45 no. of plants / sq. m ratio should not break in sesamum cultivation for better yield.
26. Sulphur fertilizer should be applied less in case of mustard.
27. Mustard should not be cultivated without irrigation.
28. Mustard should not be sown in late, without maintaining crop cycle and duration.
29. Fruit borer should be controlled in case of lentil cultivation.
30. Lentil should not be cultivated in acidic soil without applying dolomite or lime.
31. In paira method, lentil should not be cultivated without applying urea at 30-40 days after transplanting.
32. Potato having more no. of eye (buds) should not be selected for cultivation purpose.
33. Soil should be incorporated within the diameter of the selected potato.
34. If there is any infected potato, while cutting from the large potato, the knife not be used without treating with potassium permanganate.
35. Potato should not be sown until the applied fertilizer is incorporated with soil within 2-3 days of application.
36. Irrigation water should not be applied in soil matching the growth stage of the plant.
37. Rain water should not be wasted.
38. Large amount of water should not be used at a time.
39. Irrigation should not be given in plant without its critical growth stage.
40. Application of fertilizer should not be followed before irrigation.
41. Land beside irrigation channels should not be too long.
42. Irrigation channels should not be against the slope.
43. Less no. of irrigation should not be given in sandy soil.
44. More no. of irrigation should not be given in clay soil.
45. Seed should not be sown in dry soil without sprinkler irrigation.
46. Irrigation should not be given 15-20 days before harvesting.

47. Irrigation should not be given followed by fertilizer application.
48. Fertilizer should not be applied when plant is in its reproductive stage.
49. Fertilizer should not be applied in line at the time of line sowing.
50. Pulses should not be cultivated with Bio fertilizer application.
51. Excess urea should not be applied in pulses.
52. Fertilizer should not be applied in pulses without 1:2:2 ratios.
53. NPK should not be applied in oilseed without 2:1:1 ratio.
54. Fertilizer should not be applied as topdressing without using Leaf Colour Chart.
55. Excess ploughing should not be given in the field.
56. Irrigation should not be given in pulses.

Soil management

1. Without soil testing fertilizer should not be applied in the field.
2. Soil sample should not be collected from the shaded areas of any field.
3. Soil should not be collected from the ridge area for testing.
4. Soil sample should not be collected from the ridge area.
5. Due to residual effect of fertilizer soil sample should not be collected from the place where fertilizer may be stored during the cultivation of previous crop.
6. Soil sample should not be collected from the field where fertilizers are recently sprayed or applied.
7. Soil sample should not collected form cropped area
8. Soil sample should not be collected from road sided area.
9. Soil sample should not be collected from the acidic/saline or sodic pocket area of the field.
10. Soil sample collected from the field should not be dried in sunlight or oven
11. Soil should not be troughed in pond without soil testing.
12. More fertilizer should not be applied in the field.
13. Only chemical fertilizer should not be applied in the field along with organic fertilizer.
14. Chemical and bio-fertilizer should not be applied at a time in a field.
15. To increase the marketing value of tobacco MOP should not be applied.
16. Without P & K, only N should not be applied in the field.
17. Without weeding fertilizer should not be applied.
18. NH4SO4 should not be sprayed in leaf.
19. In saline soil Urea should not be applied in granular form.
20. Granular urea should not be applied in the field.
21. In acidic soil compost or vermicompost or cow dung should be applied P should not be applied.
22. Phosphate containing bio-fertilizer should not be applied in the field where it is not required.
23. Phosphate fertilizer should not be applied in broadcast method in acidic soil.
24. In a limited area more chemical fertilizer should not be applied.
25. Without applying organic fertilizer only chemical fertilizer should not be applied in the field.
26. Excessive lime should not be applied in the acidic soil.
27. In sandy acidic soil full dose of lime should not be applied at a time.
28. Continuous Ca containing lime should not be applied.
29. Without maintaining proper time gap fertilizer should not be applied.
30. Excessive wooden ash should not be applied in the field.
31. Low quantity bio-fertilizer should not be applied be applied in the field.
32. Seed and bio-fertilizer should not be incorporated in the sunlight.
33. Seed and bio-fertilizer mixer should not be dried in hot or sunlight.
34. After mixing bio-fertilizer with seed, seed should not be delayed in sowing.
35. If important information is not presented in fertilizer packet than bio -fertilizer should not be applied in the field.
36. Chemical fertiliser, insecticide, fungicide and herbicide would not be mixed with bio-fertilizer.
37. Boron -fertilizer should not be applied.
38. Micro nutrient should not be applied in the field if not required.
39. Without proper washing of the sprayer bio-fertilizer should not be applied.
40. Highly mature green-manure should not be applied in the field.
41. In drought prone area where rainfall is inadequate and irrigation facility is not available, bio-fertilizer should not be applied.
42. Without proper rotting compost should not be applied.
43. Bone meal should not be applied at a higher dose than compost fertilizer.

Tables- 1(A), 1(B) and 1(C) reflect the association between good and moderate farmer, between moderate and not so good farmer and between good and not so good farmer respectively in case of crop production related preventive innovations. It was found from the table 1(A) that out of 56 preventive innovations related to crop production in case of 44 preventive innovations results of χ^2 test were significant. That means in case of 78.57% of crop production related preventive

innovation there is an association present in between good and moderate farmers. It may be concluded from the table that good and moderate farmers show homogeneity in their knowledge about these 44 preventive innovations and their knowledge practice gap. It was revealed from the table 1(B) that out of 56 preventive innovations related to crop production, in case of 6 preventive innovations results of χ^2 test were significant. That means, in case of 10.73 % of crop production related preventive innovations, there is an association present in between moderate and not so good farmers. It may be concluded from the table that moderate and not so good farmers show homogeneity in their knowledge and knowledge practice gap only in case of 6 preventive innovations out of 56. It was observed from the table 1(C) that out of 56 preventive innovations related to crop production in case of 8 preventive innovations results of χ^2 test were significant. That means in case of 14.29 % of crop production related preventive innovation, there is an association present in between good and not so good farmers. It may be concluded from the table that good and not so good farmers show homogeneity in their knowledge and knowledge practice gap in case of 8 preventive innovations out of 56.

Tables- 2(A), 2(B) and 2(C) reflect the association between good and moderate farmer, between moderate and not so good farmer and between good and not so good farmer respectively in case of soil management related preventive innovations. It was found from the table 2(A) that out of 43 preventive innovations related to soil management, in case of 29 preventive innovations results of χ^2 test were significant. That means, there is an association present in between good and moderate farmers in case of 67.44% of total preventive innovations related to soil management. It may be concluded from the table that good and moderate farmers show homogeneity in their knowledge and knowledge practice gap about preventive innovation in case of 29 preventive innovations out of 43. It was found from the table 2(B) that out of 43 preventive innovations related to soil management, in case of 4 preventive innovations results of χ^2 test were significant. That means, there is an association present in between moderate and not so good farmers in case of 9.30% of total innovations related to soil management. It may be concluded from the table that moderate and not so good farmers show homogeneity in their knowledge and knowledge practice gap about preventive innovations in case of 4 preventive innovations out of 43related to soil management. It was found from the table 2(C) that out of 43 preventive innovations related to soil management, in case of 4 preventive innovations results of χ^2 test were significant. That means, there is an association present in between good and not so good farmers in case of 9.30% of total innovations related to soil management. It may be concluded from the table that good and not so good farmers show homogeneity in their knowledge and knowledge practice gap about preventive innovation in case of 4 preventive innovations out of 43 in soil management.

From the results of χ^2 test we may conclude that in case of soil management related preventive innovation there is a lowest homogeneity present (only in 9.30% innovation of total preventive innovations related to soil management) in between good farmer and moderate farmer in their knowledge about the innovations and knowledge practice gap. Highest homogeneity present in between good and moderate farmer (in 78.57% of total preventive innovation) in crop production related preventive innovation's knowledge and knowledge practice gap. The good and moderate farmers of this study area are very much cautious about the crop production practices and they choose the best practices of crop production. Basically the good and moderate farmers are characterised by their age, education, experience, perceptual ability and cosmopolite exposure. As a result these two farmers groups are exposed to latest know how of their crop production practices and they are very much acquainted with the preventive innovations related to crop production. Consequently their knowledge is high and knowledge practice gap on preventive innovation is low. In the contrary though the soil management related preventive innovations are well known to them but still they don't want to give due importance to the same as the practices are time consuming and expensive to them and beneficial effects of the practices are indirect and delayed.

During the era of overexploitation of natural resources and threat to ecological agriculture there is a need of persuasive extension in terms of preventive innovation for sustainable agriculture. The study had rightly identified several numbers of preventive innovations in case of crop production and soil management niche. Present study revealed that preventive innovations related to soil management are not at all risky and complex but the expected beneficial effects are delayed but the preventive innovations related to crop production are simple with immediate impact. Rate of adoption of preventive innovations is very less, especially in poor illiterate farming community (Rogers, 2004). But it should be adopted by farming community for ecological and human health. For this reason Persuasive Extension approach should be the focus of present day agriculture wherein agriculture is termed as global polluter.

Table 1(A): Crop production (association between good and moderate farmer)

Item	GF (N=34)				MF(N=51)				NSGF (N=15)				Pooled sample		Association between GF and MF		
	KP		KNP		KP		KNP		KP		KNP		KP	KNP	χ^2 value	Asym P -sig	FET
	f	p	f	p	f	p	f	p	f	p	f	p					
1.	33	97.1	1	2.9	49	96.1	1	2.0	15	100.0	0	0.0	97	2			1.00
2.	32	94.1	2	5.9	40	78.4	8	15.7	6	40.0	9	60.0	78	19			0.18
3.	34	100.0	0	0.0	24	47.1	19	27.3	14	93.3	1	6.7	72	20	17.63	0.000	
4.	33	97.1	1	12.9	32	62.7	12	23.5	2	13.3	4	26.7	67	17	6.517	0.011	
5.	33	97.1	1	2.9	24	47.1	18	35.3	2	13.3	1	6.7	59	20	13.90	0.000	
6.	32	94.1	2	5.9	19	37.3	19	45.1	3	20.0	2	13.3	54	23	18.18	0.000	
7.	29	85.3	4	11.8	23	45.1	23	45.1	1	6.7	4	26.7	53	31	10.62	0.001	
8.	31	91.2	1	2.9	16	31.4	23	45.1	3	20.0	1	6.7	50	25	22.07	0.000	
9.	29	85.3	3	8.8	17	33.3	22	43.1	3	20.0	1	6.7	49	26	15.04	0.000	
10.	27	79.4	6	17.6	20	39.2	21	41.2	3	20.0	1	6.7	50	28	7.245	0.007	
11.	26	76.5	3	8.8	12	23.5	23	45.1	2	13.3	3	20.0	40	29	17.92	0.000	
12.	26	76.5	4	11.8	14	27.5	24	47.1	3	20.0	1	6.7	43	29	15.18	0.000	
13.	29	85.3	2	5.9	12	23.5	24	47.1	1	6.9	0	0.0	42	26	22.96	0.000	
14.	29	85.3	3	8.8	12	23.5	20	39.2	0	0.0	1	6.7	41	24	17.37	0.000	
15.	25	73.5	3	8.8	10	19.6	16	31.4	0	0.0	0	0	35	19	13.12	0.000	
16.	25	73.5	2	5.9	8	15.7	14	27.45	0	0.0	1	6.7	33	17	14.96	0.000	
17.	21	61.8	10	29.4	9	17.6	15	29.4	0	0.0	0	0.0	30	25	3.845	0.050	
18.	18	52.9	12	35.3	3	5.9	29	56.9	0	0.0	1	6.7	21	42	15.52	0.000	
19.	20	58.8	9	26.5	2	3.9	30	58.8	0	0.0	0	6.7	22	39	23.30	0.000	
20.	26	76.5	8	23.5	7	13.7	24	47.1	0	6.7	2	13.3	33	34	16.74	0.000	
21.	26	76.5	4	11.8	7	13.7	23	45.1	0	0.0	2	13.3	33	29	21.81	0.000	
22.	25	73.5	6	17.6	11	21.6	7	13.7	2	13.3	1	6.7	38	14			0.184
23.	21	61.8	3	8.8	3	5.2	10	19.6	1	6.7	1	6.7	25	14			0.000
24.	22	64.7	4	11.8	8	15.7	9	17.6	1	6.7	0	0.0	31	13			0.016
25.	23	67.6	7	20.6	3	5.9	20	39.4	2	13.3	0	0.0	28	27	18.61	0.000	
26.	21	61.8	2	5.9	3	5.9	18	35.3	1	6.7	0	0.0	25	20	23.24	0.000	
27.	29	85.3	0	0.0	25	49.0	11	21.6	2	13.3	0	0.0	56	11			0.001
28.	30	88.2	0	0.0	18	35.3	15	29.4	1	6.7	0	0.0	49	15	15.48	0.000	
29.	27	79.4	1	2.9	9	17.6	20	39.2	0	0.0	1	6.7	36	22	23.44	0.000	
30.	23	67.6	1	2.9	9	17.6	16	31.4	9	0.0	0	0.0	41	17	16.79	0.000	
31.	20	58.8	4	11.8	1	2.0	16	31.4	1	6.7	0	0.0	22	20	20.89	0.000	
32.	31	91.2	2	5.9	11	21.6	12	23.5	4	26.7	2	13.3	46	16	13.01	0.000	
33.	25	73.5	8	23.5	11	21.6	20	39.2	10	66.7	2	13.3	46	30	8.962	0.003	
34.	23	67.6	10	29.4	6	11.8	27	52.9	1	6.7	5	33.3	30	42	15.74	0.006	
35.	25	73.5	6	17.6	15	29.4	24	47.1	6	40	3	20.00	46	33	10.88	0.001	
36.	21	61.8	12	35.3	18	35.3	29	56.9	8	53.3	2	13.3	47	43	4.020	0.045	
37.	24	70.6	10	29.4	21	41.2	30	58.8	2	13.3	8	53.3	47	48	5.952	0.015	
38.	32	94.1	2	5.9	36	70.6	14	27.5	6	40.0	1	6.7	74	17	5.066	0.024	
39.	33	97.1	1	2.9	29	56.9	21	41.2	8	53.3	2	13.3	70	24	14.01	0.000	
40.	34	100.0	0	0.0	29	56.9	20	39.2	9	60.0	1	6.7	72	21	16.12	0.000	
41.	32	94.1	2	5.9	33	64.7	15	25.5	13	36.7	0	0.0	78	17	5.042	0.025	

cont...

Table 1(A): Crop production (association between good and moderate farmer)

Item	GF (N=34)				MF(N=51)				NSGF (N=15)				Pooled sample		Association between GF and MF		
	KP		KNP		KP		KNP		KP		KNP		KP	KNP	χ^2value	Asym P -sig	FET
	f	p	f	p	f	p	f	p	f	p	f	p					
42.	34	100.0	0	0.0	34	66.7	14	27.5	13	86.7	0	0.0	81	14	9.987**	0.002	
43.	33	97.1	1	2.9	44	86.3	6	11.8	14	93.3	0	0.0	91	7			0.233
44.	31	91.2	1	8.8	42	82.4	8	15.7	14	93.3	0	0.0	87	9			0.513
45.	33	97.1	1	2.9	25	49.0	9	17.6	6	40.0	1	6.7	64	11	5.745*	0.017	
46.	30	88.2	2	5.9	27	52.9	9	17.6	2	13.3	3	20.0	59	14	3.118	0.077	
47.	27	79.4	5	14.7	28	54.9	10	19.6	3	20.0	1	6.7	58	16	0.630	0.427	
48.	28	82.4	1	2.9	29	56.9	11	21.6	5	33.3	0	0.0	62	12	5.199*	0.023	
49.	23	67.6	1	2.9	30	58.8	10	19.6	4	26.7	2	13.3	57	13			0.042
50.	13	38.2	8	23.5	16	31.4	6	11.8	1	6.7	0	0.0	30	14	0.186	0.666	
51.	20	58.8	9	26.5	9	17.6	1	2.0	3	6.7	0	0.0	32	10			0.402
52.	11	32.4	15	44.1	8	15.7	3	5.9	2	13.3	0	0.0	21	18	1.775	0.183	
53.	9	26.5	5	14.7	2	3.9	5	9.8	1	6.7	0	0.0	12	10			0.183
54.	11	32.4	5	14.7	7	13.7	12	23.5	1	6.7	0	0.0	19	17	2.374	0.123	
55.	23	67.6	1	2.9	19	37.3	7	13.7	3	20	1	6.7	45	9			0.050
56.	19	55.9	2	2.9	19	37.3	12	23.5	1	6.7	1	6.7	39	15			0.027

*Note: f- Frequency, p- Percentage, GF-good farmer, MF-moderate farmer, NSGF-not so good farmer, KP-knowledge practice, KNP-knowledge no practice; *,** Chi-square(χ^2) is significant at 5% and 1% level, respectively*

Table 1(B): Crop production (association between moderate and not so good farmer)

Item	GF (N=34)				MF(N=51)				NSGF (N=15)				Pooled sample		Association between MF and NSGF		
	KP		KNP		KP		KNP		KP		KNP		KP	KNP	χ^2value	AsymP - sig	FET
	f	p	f	p	f	p	f	p	f	p	f	p					
1.	33	97.1	1	2.9	49	96.1	1	2.0	15	100.0	0	0.0	97	2			1.000
2.	32	94.1	2	5.9	40	78.4	8	15.7	6	40.0	9	60.0	78	19			0.002
3.	34	100.0	0	0.0	24	47.1	19	27.3	14	93.3	1	6.7	72	20	5.368*	0.021	
4.	33	97.1	1	12.9	32	62.7	12	23.5	2	13.3	4	26.7	67	17			0.074
5.	33	97.1	1	2.9	24	47.1	18	35.3	2	13.3	1	6.7	59	20			1.000
6.	32	94.1	2	5.9	19	37.3	19	45.1	3	20.0	2	13.3	54	23			0.654
7.	29	85.3	4	11.8	23	45.1	23	45.1	1	6.7	4	26.7	53	31			0.354
8.	31	91.2	1	2.9	16	31.4	23	45.1	3	20.0	1	6.7	50	25			0.306
9.	29	85.3	3	8.8	17	33.3	22	43.1	3	20.0	1	6.7	49	26			0.323
10.	27	79.4	6	17.6	20	39.2	21	41.2	3	20.0	1	6.7	50	28			0.608
11.	26	76.5	3	8.8	12	23.5	23	45.1	2	13.3	3	20.0	40	29			1.000
12.	26	76.5	4	11.8	14	27.5	24	47.1	3	20.0	1	6.7	43	29			0.286
13.	29	85.3	2	5.9	12	23.5	24	47.1	1	6.9	0	0.0	42	26			0.351
14.	29	85.3	3	8.8	12	23.5	20	39.2	0	0.0	1	6.7	41	24			1.000
15.	25	73.5	3	8.8	10	19.6	16	31.4	0	0.0	0	0.0	35	19			NSP

cont...

Table 1(B): Crop production (association between moderate and not so good farmer)

Item	GF (N=34)				MF(N=51)				NSGF (N=15)				Pooled sample		Association between MF and NSGF		
	KP		KNP		KP		KNP		KP		KNP		KP	KNP	χ^2value	Asym P -sig	FET
	f	p	f	p	f	p	f	p	f	p	f	p					
16.	25	73.5	2	5.9	8	15.7	14	27.45	0	0.0	1	6.7	33	17			1.006
17.	21	61.8	10	29.4	9	17.6	15	29.4	0	0.0	0	0.0	30	25			NSP
18.	18	52.9	12	35.3	3	5.9	29	56.9	0	0.0	1	6.7	21	42			1.000
19.	20	58.8	9	26.5	2	3.9	30	58.8	0	0.0	0	6.7	22	39			1.000
20.	26	76.5	8	23.5	7	13.7	24	47.1	0	6.7	2	13.3	33	34			1.000
21.	26	76.5	4	11.8	7	13.7	23	45.1	0	0.0	2	13.3	33	29			1.000
22.	25	73.5	6	17.6	11	21.6	7	13.7	2	13.3	1	6.7	38	14	0.184	1.000	
23.	21	61.8	3	8.8	3	5.2	10	19.6	1	6.7	1	6.7	25	14	0.000	0.476	
24.	22	64.7	4	11.8	8	15.7	9	17.6	1	6.7	0	0.0	31	13	0.016	1.000	
25.	23	67.6	7	20.6	3	5.9	20	39.4	2	13.3	0	0.0	28	27			0.033
26.	21	61.8	2	5.9	3	5.9	18	35.3	1	6.7	0	0.0	25	20			0.182
27.	29	85.3	0	0.0	25	49.0	11	21.6	2	13.3	0	0.0	56	11			1.000
28.	30	88.2	0	0.0	18	35.3	15	29.4	1	6.7	0	0.0	49	15			1.000
29.	27	79.4	1	2.9	9	17.6	20	39.2	0	0.0	1	6.7	36	22			1.000
30.	23	67.6	1	2.9	9	17.6	16	31.4	9	0.0	0	0.0	41	17			NSP
31.	20	58.8	4	11.8	1	2.0	16	31.4	1	6.7	0	0.0	22	20			0.111
32.	31	91.2	2	5.9	11	21.6	12	23.5	4	26.7	2	13.3	46	16			0.651
33.	25	73.5	8	23.5	11	21.6	20	39.2	10	66.7	2	13.3	46	30	6.128*	0.013	
34.	23	67.6	10	29.4	6	11.8	27	52.9	1	6.7	5	33.3	30	42			1.000
35.	25	73.5	6	17.6	15	29.4	24	47.1	6	40.0	3	20.00	46	33			0.153
36.	21	61.8	12	35.3	18	35.3	29	56.9	8	53.3	2	13.3	47	43			0.032
37.	24	70.6	10	29.4	21	41.2	30	58.8	2	13.3	8	53.3	47	48			0.294
38.	32	94.1	2	5.9	36	70.6	14	27.5	6	40	1	6.7	74	17			0.662
39.	33	97.1	1	2.9	29	56.9	21	41.2	8	53.3	2	13.3	70	24			0.291
40.	34	100.0	0	0.0	29	56.9	20	39.2	9	60.0	1	6.7	72	21			0.080
41.	32	94.1	2	5.9	33	64.7	15	25.5	13	36.7	0	0.0	78	17			0.052
42.	34	100.0	0	0.0	34	66.7	14	27.5	13	86.7	0	0.0	81	14			0.028
43.	33	97.1	1	2.9	44	86.3	6	11.8	14	93.3	0	0.0	91	7			0.325
44.	31	91.2	1	8.8	42	82.4	8	15.7	14	93.3	0	0.0	87	9			0.183
45.	33	97.1	1	2.9	25	49.0	9	17.6	6	40.0	1	6.7	64	11			0.660
46.	30	88.2	2	5.9	27	52.9	9	17.6	2	13.3	3	20.0	59	14			0.139
47.	27	79.4	5	14.7	28	54.9	10	19.6	3	20.0	1	6.7	58	16			1.000
48.	28	82.4	1	2.9	29	56.9	11	21.6	5	33.3	0	0.0	62	12			0.313
49.	23	67.6	1	2.9	30	58.8	10	19.6	4	26.7	2	13.3	57	13			0.644
50.	13	38.2	8	23.5	16	31.4	6	11.8	1	6.7	0	0.0	30	14			1.000
51.	20	58.8	9	26.5	9	17.6	1	2.0	3	6.7	0	0.0	32	10			1.000
52.	11	32.4	15	44.1	8	15.7	3	5.9	2	13.3	0	0.0	21	18			1.000
53.	9	26.5	5	14.7	2	3.9	5	9.8	1	6.7	0	0.0	12	10			0.375
54.	11	32.4	5	14.7	7	13.7	12	23.5	1	6.7	0	0.0	19	17			0.400
55.	23	67.6	1	2.9	19	37.3	7	13.7	3	20.0	1	6.7	45	9			1.000
56.	19	55.9	2	2.9	19	37.3	12	23.5	1	6.7	1	6.7	39	15			1.000

*Note: f- Frequency, p- Percentage, GF-good farmer, MF-moderate farmer, NSGF-not so good farmer, KP-knowledge practice, KNP-knowledge no practice; *,** Chi-square is significant at 5% and 1% level, respectively*

Table 1(C): Crop production (association between good and not so good farmer)

Item	GF (N=34)				MF(N=51)				NSGF (N=15)				Pooled sample		Association between GF and NSGF		
	KP		KNP		KP		KNP		KP		KNP		KP	KNP	χ^2value	Asym P -sig	FET
	f	p	f	p	f	p	f	p	f	p	f	p					
1.	33	97.1	1	2.9	49	96.1	1	2.0	15	100.0	0	0.0	97	2			1.000
2.	32	94.1	2	5.9	40	78.4	8	15.7	6	40.0	9	60.0	78	19			0.000
3.	34	100	0	0.0	24	47.1	19	27.3	14	93.3	1	6.7	72	20			0.306
4.	33	97.1	1	12.9	32	62.7	12	23.5	2	13.3	4	26.7	67	17			0.001
5.	33	97.1	1	2.9	24	47.1	18	35.3	2	13.3	1	6.7	59	20			0.158
6.	32	94.1	2	5.9	19	37.3	19	45.1	3	20.0	2	13.3	54	23			0.072
7.	29	85.3	4	11.8	23	45.1	23	45.1	1	6.7	4	26.7	53	31			0.004
8.	31	91.2	1	2.9	16	31.4	23	45.1	3	20.0	1	6.7	50	25			0.213
9.	29	85.3	3	8.8	17	33.3	22	43.1	3	20.0	1	6.7	49	26			0.390
10.	27	79.4	6	17.6	20	39.2	21	41.2	3	20.0	1	6.7	50	28			1.000
11.	26	76.5	3	8.8	12	23.5	23	45.1	2	13.3	3	20	40	29			0.029
12.	26	76.5	4	11.8	14	27.5	24	47.1	3	20	1	6.7	43	29			0.488
13.	29	85.3	2	5.9	12	23.5	24	47.1	1	6.9	0	0.0	42	26			1.000
14.	29	85.3	3	8.8	12	23.5	20	39.2	0	0.0	1	6.7	41	24			0.121
15.	25	73.5	3	8.8	10	19.6	16	31.4	0	0.0	0	0.0	35	19			NSP
16.	25	73.5	2	5.9	8	15.7	14	27.45	0	0.0	1	6.7	33	17			0.107
17.	21	61.8	10	29.4	9	17.6	15	29.4	0	0.0	0	0.0	30	25			NSP
18.	18	52.9	12	35.3	3	5.9	29	56.9	0	0.0	1	6.7	21	42			0.419
19.	20	58.8	9	26.5	2	3.9	30	58.8	0	0.0	0	6.7	22	39			0.333
20.	26	76.5	8	23.5	7	13.7	24	47.1	0	6.7	2	13.3	33	34			0.172
21.	26	76.5	4	11.8	7	13.7	23	45.1	0	0.0	2	13.3	33	29			0.030
22.	25	73.5	6	17.6	11	21.6	7	13.7	2	13.3	1	6.7	38	14			0.511
23.	21	61.8	3	8.8	3	5.2	10	19.6	1	6.7	1	6.7	25	14			0.289
24.	22	64.7	4	11.8	8	15.7	9	17.6	1	6.7	0	0.0	31	13			1.000
25.	23	67.6	7	20.6	3	5.9	20	39.4	2	13.3	0	0.0	28	27			1.000
26.	21	61.8	2	5.9	3	5.9	18	35.3	1	6.7	0	0.0	25	20			1.000
27.	29	85.3	0	0.0	25	49.0	11	21.6	2	13.3	0	0.0	56	11			NSP
28.	30	88.2	0	0.0	18	35.3	15	29.4	1	6.7	0	0.0	49	15			NSP
29.	27	79.4	1	2.9	9	17.6	20	39.2	0	0.0	1	6.7	36	22			0.069
30.	23	67.6	1	2.9	9	17.6	16	31.4	9	0.0	0	0.0	41	17			NSP
31.	20	58.8	4	11.8	1	2.0	16	31.4	1	6.7	0	0.0	22	20			1.000
32.	31	91.2	2	5.9	11	21.6	12	23.5	4	26.7	2	13.3	46	16			0.104
33.	25	73.5	8	23.5	11	21.6	20	39.2	10	66.7	2	13.3	46	30			0.705
34.	23	67.6	10	29.4	6	11.8	27	52.9	1	6.7	5	33.3	30	42			0.024
35.	25	73.5	6	17.6	15	29.4	24	47.1	6	40.0	3	20.00	46	33			0.394
36.	21	61.8	12	35.3	18	35.3	29	56.9	8	53.3	2	13.3	47	43			0.456
37.	24	70.6	10	29.4	21	41.2	30	58.8	2	13.3	8	53.3	47	48			0.000
38.	32	94.1	2	5.9	36	70.6	14	27.5	6	40.0	1	6.7	74	17			0.439
39.	33	97.1	1	2.9	29	56.9	21	41.2	8	53.3	2	13.3	70	24			0.125
40.	34	100.0	0	0.0	29	56.9	20	39.2	9	60.0	1	6.7	72	21			0.227
41.	32	94.1	2	5.9	33	64.7	15	25.5	13	36.7	0	0.0	78	17			1.000

cont...

Table 1(C): Crop production (association between good and not so good farmer)

Item	GF (N=34)				MF(N=51)				NSGF (N=15)				Pooled sample		Association between GF and NSGF		
	KP		KNP		KP		KNP		KP		KNP		KP	KNP	χ^2value	AsymP - sig	FET
	f	p	f	p	f	p	f	p	f	p	f	p					
42.	34	100.0	0	0.0	34	66.7	14	27.5	13	86.7	0	0.0	81	14			NSP
43.	33	97.1	1	2.9	44	86.3	6	11.8	14	93.3	0	0.0	91	7			1.000
44.	31	91.2	1	8.8	42	82.4	8	15.7	14	93.3	0	0.0	87	9			0.546
45.	33	97.1	1	2.9	25	49.0	9	17.6	6	40.0	1	6.7	64	11			0.316
46.	30	88.2	2	5.9	27	52.9	9	17.6	2	13.3	3	20.0	59	14			0.012
47.	27	79.4	5	14.7	28	54.9	10	19.6	3	20.0	1	6.7	58	16			0.535
48.	28	82.4	1	2.9	29	56.9	11	21.6	5	33.3	0	0.0	62	12			1.000
49.	23	67.6	1	2.9	30	58.8	10	19.6	4	26.7	2	13.3	57	13			0.094
50.	13	38.2	8	23.5	16	31.4	6	11.8	1	6.7	0	0.0	30	14			1.000
51.	20	58.8	9	26.5	9	17.6	1	2.0	3	6.7	0	0.0	32	10			1.000
52.	11	32.4	15	44.1	8	15.7	3	5.9	2	13.3	0	0.0	21	18			0.206
53.	9	26.5	5	14.7	2	3.9	5	9.8	1	6.7	0	0.0	12	10			1.000
54.	11	32.4	5	14.7	7	13.7	12	23.5	1	6.7	0	0.0	19	17			1.000
55.	23	67.6	1	2.9	19	37.3	7	13.7	3	20.0	1	6.7	45	9			0.270
56.	19	55.9	2	2.9	19	37.3	12	23.5	1	6.7	1	6.7	39	15			0.249

*Note: f- Frequency, p- Percentage, GF-good farmer, MF-moderate farmer, NSGF-not so good farmer, KP-knowledge practice, KNP-knowledge no practice; *,** Chi-square is significant at 5% and 1% level, respectively*

Table 2(A): Soil management (association between good and moderate farmer)

Item	GF (N=34)				MF(N=51)				NSGF (N=15)				Pooled sample		Association between GF and MF		
	KP		KNP		KP		KNP		KP		KNP		KP	KNP	χ^2value	AsymP - sig	FET
	f	p	f	p	f	p	f	p	f	p	f	p					
1.	30	88.2	4	11.8	1	2.0	42	82.4	1	6.7	1	6.7	32	47	54.747**	0.00	
2.	34	100.0	0	0.0	2	3.9	31	60.8	1	6.7	1	6.7	37	32	55.724**	0.00	
3.	34	100.0	0	0.0	8	15.7	29	56.9	1	6.7	1	6.7	43	30	41.863**	0.00	
4.	34	100.0	0	0.0	8	15.7	35	68.6	1	6.7	1	6.7	43	36	47.507**	0.00	
5.	34	100.0	0	0.0	8	15.7	35	68.6	1	6.7	1	6.7	39	36	47.507**	0.00	
6.	34	100.0	0	0.0	4	7.8	38	74.5	1	6.7	1	6.7	39	39	57.958**	0.00	
7.	34	100.0	0	0.0	4	7.8	38	74.5	1	6.7	1	6.7	43	39	57.958**	0.00	
8.	34	100.0	0	0.0	8	15.7	34	66.7	1	6.7	1	6.7	39	35	46.584**	0.00	
9.	34	100.0	0	0.0	4	7.8	34	66.7	1	6.7	1	6.7	43	35	54.106**	0.00	
10.	34	100.0	0	0.0	8	15.7	33	64.7	1	6.7	1	6.7	35	34	45.656**	0.00	
11.	33	91.2	3	8.8	1	2.0	36	70.6	1	6.7	1	6.7	66	40	52.505**	0.00	
12.	33	97.1	1	2.9	22	43.1	28	94.5	11	73.3	0	0.0	55	29	22.912**	0.00	
13.	23	67.1	11	32.4	23	45.1	20	39.2	9	60.0	1	6.7	55	32	1.049	0.31	
14.	29	85.3	5	14.7	13	25.5	19	37.3	3	20.0	3	20.0	45	27	12.350**	0.00	
15.	6	17.6	0	0.0	0	0.0	12	23.5	1	6.7	0	0.0	7	12			0.11

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Table 2(A): Soil management (association between good and moderate farmer)

Item	GF (N=34)				MF(N=51)				NSGF (N=15)				Pooled sample		Association between GF and MF		
	KP		KNP		KP		KNP		KP		KNP		KP	KNP	χ^2value	Asym P -sig	FET
	f	p	f	p	f	p	f	p	f	p	f	p					
16.	33	97.1	1	2.9	38	74.5	6	11.8	13	87.8	0	0.0	84	7			0.130
17.	33	91.2	3	8.8	40	78.4	11	61.6	11	73.3	14	26.7	84	28	1.571	0.210	
18.	21	61.8	0	0.0	36	70.6	2	3.9	5	33.3	2	13.3	62	4			0.534
19.	16	47.1	1	2.9	10	19.6	11	21.6	7	46.7	2	13.3	33	14	7.372**	0.007	
20.	30	88.2	2	5.9	36	70.6	6	11.8	1	6.7	5	33.3	67	13	0.526	0.468	
21.	21	61.8	1	2.9	7	13.7	10	19.6	2	13.3	3	20.0	30	14			0.000
22.	12	35.3	2	5.9	14	27.5	17	33.3	3	20.0	4	26.7	29	23	4.946*	0.026	
23.	20	58.8	0	0.0	12	23.5	14	27.5	4	26.7	0	0.0	36	14	13.042*	0.000	
24.	29	85.3	0	0.0	36	70.6	15	29.4	12	80.0	2	13.3	77	17	8.656**	0.003	
25.	24	70.6	10	29.4	34	66.7	15	29.4	9	60.0	2	13.3	67	27	0.000	1.000	
26.	21	61.8	5	14.7	16	31.4	22	43.1	7	46.7	1	6.7	44	28	7.943*	0.005	
27.	15	41.1	7	20.6	6	31.4	10	19.6	3	20.0	1	6.7	24	23	0.031	0.860	
28.	24	70.6	3	8.8	26	51.0	4	7.8	2	13.3	6	40.0	52	12			1.000
29.	32	94.1	2	5.9	20	39.2	15	29.4	9	60.0	5	33.3	61	18	10.785*	0.001	
30.	23	67.6	1	2.9	39	76.5	4	7.8	2	13.3	1	6.7	64	6			1.647
31.	22	64.7	1	2.9	25	59.0	9	17.6	1	6.7	1	6.7	48	11			0.038
32.	32	94.1	1	2.9	21	41.2	8	15.7	1	6.7	1	6.7	54	10			0.009
33.	33	97.1	0	0.0	23	45.1	0	0.0	1	6.7	1	6.7	57	1			NSP
34.	33	97.1	0	0.0	32	62.7	6	11.8	1	6.7	1	6.7	66	7			0.027
35.	33	97.1	1	2.9	24	47.1	11	21.6	1	6.7	1	6.7	58	13	7.860*	0.025	
36.	32	94.1	1	2.9	19	37.3	19	37.3	1	6.7	1	6.7	52	21	17.006*	0.000	
37.	16	47.1	4	11.8	15	29.4	10	19.6	2	13.3	1	6.7	33	15	1.246	0.264	
38.	33	97.1	0	0.0	33	64.7	6	11.8	5	33.3	1	6.7	71	7			0.028
39.	34	100	0	0.0	21	41.2	20	39.2	2	13.3	1	6.7	57	21	20.191*	0.000	
40.	20	58.8	3	8.8	20	39.2	12	23.5	2	13.3	1	6.7	42	16	2.896	0.089	
41.	24	70.6	0	0.0	14	27.5	8	15.7	2	13.3	0	0.0	40	8			0.001
42.	25	73.5	0	0.0	13	25.5	12	23.5	2	13.3	0	0.0	40	12			0.000
43.	24	70.6	1	2.9	12	23.5	1	2.0	2	13.3	0	0.0	38	2			1.000

*Note: f- Frequency, p- Percentage, GF-good farmer, MF-moderate farmer, NSGF-not so good farmer, KP-knowledge practice, KNP-knowledge no practice; *,** Chi-square is significant at 5% and 1% level, respectively*

Table 2(B): Soil management (association between moderate farmers and not so good farmers)

Item	GF (N=34)				MF(N=51)				NSGF (N=15)				Pooled sample		Association between MF and NSGF		
	KP		KNP		KP		KNP		KP		KNP		KP	KNP	χ^2value	Asym P-sig	FET
	f	p	f	p	f	p	f	p	f	p	f	p					
1.	30	88.2	4	11.8	1	2.0	42	82.4	1	6.7	1	6.7	32	47			0.088
2.	34	100	0	0.0	2	3.9	31	60.8	1	6.7	1	6.7	37	32			0.166
3.	34	100	0	0.0	8	15.7	29	56.9	1	6.7	1	6.7	43	30			0.413
4.	34	100	0	0.0	8	15.7	35	68.6	1	6.7	1	6.7	43	36			0.364
5.	34	100	0	0.0	8	15.7	35	68.6	1	6.7	1	6.7	39	36			0.364
6.	34	100	0	0.0	4	7.8	38	74.5	1	6.7	1	6.7	39	39			0.217
7.	34	100	0	0.0	4	7.8	38	74.5	1	6.7	1	6.7	43	39			0.217
8.	34	100	0	0.0	8	15.7	34	66.7	1	6.7	1	6.7	39	35			0.371
9.	34	100	0	0.0	4	7.8	34	66.7	1	6.7	1	6.7	43	35			0.237
10.	34	100	0	0.0	8	15.7	33	64.7	1	6.7	1	6.7	35	34			0.379
11.	33	91.2	3	8.8	1	2.0	36	70.6	1	6.7	1	6.7	66	40			0.101
12.	33	97.1	1	2.9	22	43.1	28	94.5	11	73.3	0	0.0	55	29	9.243**	0.002	
13.	23	67.1	11	32.4	23	45.1	20	39.2	9	60.0	1	6.7	55	32			0.069
14.	29	85.3	5	14.7	13	25.5	19	37.3	3	20.0	3	20.0	45	27			0.682
15.	6	17.6	0	0.0	0	0.0	12	23.5	1	6.7	0	0.0	7	12			0.077
16.	33	97.1	1	2.9	38	74.5	6	11.8	13	87.8	0	0.0	84	7			0.319
17.	33	91.2	3	8.8	40	78.4	11	61.6	11	73.3	14	26.7	84	28			0.751
18.	21	61.8	0	0.0	36	70.6	2	3.9	5	33.3	2	13.3	62	4			0.108
19.	16	47.1	1	2.9	10	19.6	11	21.6	7	46.7	2	13.3	33	14			0.229
20.	30	88.2	2	5.9	36	70.6	6	11.8	1	6.7	5	33.3	67	13			0.001
21.	21	61.8	1	2.9	7	13.7	10	19.6	2	13.3	3	20.0	30	14			1.000
22.	12	35.3	2	5.9	14	27.5	17	33.3	3	20.0	4	26.7	29	23			1.000
23.	20	58.8	0	0.0	12	23.5	14	27.5	4	26.7	0	0.0	36	14			0.103
24.	29	85.3	0	0.0	36	70.6	15	29.4	12	80.0	2	13.3	77	17			0.323
25.	24	70.6	10	29.4	34	66.7	15	29.4	9	60.0	2	13.3	67	27			0.712
26.	21	61.8	5	14.7	16	31.4	22	43.1	7	46.7	1	6.7	44	28			0.047
27.	15	41.1	7	20.6	6	31.4	10	19.6	3	20.0	1	6.7	24	23			1.000
28.	24	70.6	3	8.8	26	51.0	4	7.8	2	13.3	6	40.0	52	12			0.002
29.	32	94.1	2	5.9	20	39.2	15	29.4	9	60.0	5	33.3	61	18	0.019	0.890	
30.	23	67.6	1	2.9	39	76.5	4	7.8	2	13.3	1	6.7	64	6			0.298
31.	22	64.7	1	2.9	25	59.0	9	17.6	1	6.7	1	6.7	48	11			0.484
32.	32	94.1	1	2.9	21	41.2	8	15.7	1	6.7	1	6.7	54	10			0.503
33.	33	97.1	0	0.0	23	45.1	0	0.0	1	6.7	1	6.7	57	1			0.080
34.	33	97.1	0	0.0	32	62.7	6	11.8	1	6.7	1	6.7	66	7			0.323
35.	33	97.1	1	2.9	24	47.1	11	21.6	1	6.7	1	6.7	58	13			1.000
36.	32	94.1	1	2.9	19	37.3	19	37.3	1	6.7	1	6.7	52	21			1.000
37.	16	47.1	4	11.8	15	29.4	10	19.6	2	13.3	1	6.7	33	15			1.000
38.	33	97.1	0	0.0	33	64.7	6	11.8	5	33.3	1	6.7	71	7			1.000
39.	34	100	0	0.0	21	41.2	20	39.2	2	13.3	1	6.7	57	21			1.000
40.	20	58.8	3	8.8	20	39.2	12	23.5	2	13.3	1	6.7	42	16			1.000
41.	24	70.6	0	0.0	14	27.5	8	15.7	2	13.3	0	0.0	40	8			0.536
42.	25	73.5	0	0.0	13	25.5	12	23.5	2	13.3	0	0.0	40	12			0.487
43.	24	70.6	1	2.9	12	23.5	1	2.0	2	13.3	0	0.0	38	2			1.000

*Note: f- Frequency, p- Percentage, GF-good farmer, MF-moderate farmer, NSGF-not so good farmer, KP-knowledge practice, KNP-knowledge no practice; *,** Chi-square is significant at 5% and 1% level, respectively*

Table 2(C): Soil management (association between good farmers and not so good farmers)

Item	GF (N=34)				MF(N=51)				NSGF (N=15)				Pooled sample		Association between GF and NSGF		
	KP		KNP		KP		KNP		KP		KNP		KP	KNP	χ^2value	Asym P -sig	FET
	f	p	f	p	f	p	f	p	f	p	f	p					
1.	30	88.2	4	11.8	1	2.0	42	82.4	1	6.7	1	6.7	32	47			0.264
2.	34	100.0	0	0.0	2	3.9	31	60.8	1	6.7	1	6.7	37	32			0.056
3.	34	100.0	0	0.0	8	15.7	29	56.9	1	6.7	1	6.7	43	30			0.056
4.	34	100.0	0	0.0	8	15.7	35	68.6	1	6.7	1	6.7	43	36			0.056
5.	34	100.0	0	0.0	8	15.7	35	68.6	1	6.7	1	6.7	39	36			0.056
6.	34	100.0	0	0.0	4	7.8	38	74.5	1	6.7	1	6.7	39	39			0.056
7.	34	100.0	0	0.0	4	7.8	38	74.5	1	6.7	1	6.7	43	39			0.056
8.	34	100.0	0	0.0	8	15.7	34	66.7	1	6.7	1	6.7	39	35			0.056
9.	34	100.0	0	0.0	4	7.8	34	66.7	1	6.7	1	6.7	43	35			0.056
10.	34	100.0	0	0.0	8	15.7	33	64.7	1	6.7	1	6.7	35	34			0.056
11.	33	91.2	3	8.8	1	2.0	36	70.6	1	6.7	1	6.7	66	40			0.213
12.	33	97.1	1	2.9	22	43.1	28	94.5	11	73.3	0	0.0	55	29			1.000
13.	23	67.1	11	32.4	23	45.1	20	39.2	9	60.0	1	6.7	55	32			0.241
14.	29	85.3	5	14.7	13	25.5	19	37.3	3	20.0	3	20.0	45	27			0.082
15.	6	17.6	0	0.0	0	0.0	12	23.5	1	6.7	0	0.0	7	12			NSP
16.	33	97.1	1	2.9	38	74.5	6	11.8	13	87.8	0	0.0	84	7			1.000
17.	33	91.2	3	8.8	40	78.4	11	61.6	11	73.3	14	26.7	84	28			0.179
18.	21	61.8	0	0.0	36	70.6	2	3.9	5	33.3	2	13.3	62	4			0.086
19.	16	47.1	1	2.9	10	19.6	11	21.6	7	46.7	2	13.3	33	14			0.268
20.	30	88.2	2	5.9	36	70.6	6	11.8	1	6.7	5	33.3	67	13			0.000
21.	21	61.8	1	2.9	7	13.7	10	19.6	2	13.3	3	20.0	30	14			0.013
22.	12	35.3	2	5.9	14	27.5	17	33.3	3	20.0	4	26.7	29	23			0.120
23.	20	58.8	0	0.0	12	23.5	14	27.5	4	26.7	0	0.0	36	14			NSP
24.	29	85.3	0	0.0	36	70.6	15	29.4	12	80.0	2	13.3	77	17			0.101
25.	24	70.6	10	29.4	34	66.7	15	29.4	9	60.0	2	13.3	67	27			0.699
26.	21	61.8	5	14.7	16	31.4	22	43.1	7	46.7	1	6.7	44	28			1.000
27.	15	41.1	7	20.6	6	31.4	10	19.6	3	20.0	1	6.7	24	23			1.000
28.	24	70.6	3	8.8	26	51.0	4	7.8	2	13.3	6	40.0	52	12			0.001
29.	32	94.1	2	5.9	20	39.2	15	29.4	9	60.0	5	33.3	61	18			0.017
30.	23	67.6	1	2.9	39	76.5	4	7.8	2	13.3	1	6.7	64	6			0.214
31.	22	64.7	1	2.9	25	59.0	9	17.6	1	6.7	1	6.7	48	11			0.157
32.	32	94.1	1	2.9	21	41.2	8	15.7	1	6.7	1	6.7	54	10			0.113
33.	33	97.1	0	0.0	23	45.1	0	0.0	1	6.7	1	6.7	57	1			0.057
34.	33	97.1	0	0.0	32	62.7	6	11.8	1	6.7	1	6.7	66	7			0.057
35.	33	97.1	1	2.9	24	47.1	11	21.6	1	6.7	1	6.7	58	13			0.110
36.	32	94.1	1	2.9	19	37.3	19	37.3	1	6.7	1	6.7	52	21			0.113
37.	16	47.1	4	11.8	15	29.4	10	19.6	2	13.3	1	6.7	33	15			0.539
38.	33	97.1	0	0.0	33	64.7	6	11.8	5	33.3	1	6.7	71	7			0.154
39.	34	100.0	0	0.0	21	41.2	20	39.2	2	13.3	1	6.7	57	21			0.081
40.	20	58.8	3	8.8	20	39.2	12	23.5	2	13.3	1	6.7	42	16			0.408
41.	24	70.6	0	0.0	14	27.5	8	15.7	2	13.3	0	0.0	40	8			NSP
42.	25	73.5	0	0.0	13	25.5	12	23.5	2	13.3	0	0.0	40	12			NSP
43.	24	70.6	1	2.9	12	23.5	1	2.0	2	13.3	0	0.0	38	2			1.000

*Note: f- Frequency, p- Percentage, GF-good farmer, MF-moderate farmer, NSGF-not so good farmer, KP-knowledge practice, KNP-knowledge no practice; *,** Chi-square is significant at 5% and 1% level, respectively*

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