Farmers's Perception of Sugar cane Production and Marketing Problems in Qena and Asswan Governorates, Egypt

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Abstract: The main objective of this paper was to know farmers' perception and evaluation of problems facing sugar cane growers in Qena and Asswan governorates, Egypt. An empirical investigation was carried out to identify and assess problems facing sugarcane growers in six villages in these two governorates (four villages in Qena and two villages in Asswan). The identification of sugarcane problems was based on data gathered from nine focus groups held with farmers in three villages and problems identified in the previous research. Twenty seven production problems and nineteen marketing problems were identified. The assessment of these identified problems was based on survey data collected by means of personal interview using questionnaires from a random sample of 262 farmers in the other three villages (Two villages in Qena and One village in Asswan). Sample members were asked to state whether each problem existed, the degree of its importance, and efforts devoted to solve it. Different methods and techniques were used for problems assessment. These are: importance, achievement, the discrepancy between importance and achievement, Borich model, Delta N, and the Modified Delta N method. Results showed that most of the identified problems were perceived by farmers were evaluated as important or very important problems. Differences among farmers in the three villages in the two governorates were examined. Problems were rank ordered according to the results of different assessment methods and techniques. Ranking results showed spatial differences among farmers in the two governorates. The extension system should be aware of such problems and differences and plan its programmes and activities based on them.

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1. Introduction:

Sugar cane is one of the main agricultural products in Egypt. It is grown mainly in middle and Upper Egypt. But most of the area under sugarcane in Egypt (over 72 %) is grown in Qena and Asswan governorates. Also over 72 % of sugarcane production is produced in these two governorates (Abdel-Maksoud and Elshrabassee, 2007).

In order to increase the productivity of agricultural crops and achieve agricultural development in Egypt, there must exist: an effective research system which is capable to produce the new technology, and an effective agricultural extension system which is capable to diffuse the new technology among farmers and encourage them for their adoption. Effective extension programmes and activities should be planned on the basis of clients' problems and needs. Therefore, modern sophisticated methods of problems and needs determination and assessment are essential for effective extension programmes.

Problems and needs assessment refers to the process of identifying problems and needs and placing them in some order of priority. There are several approaches, quantitative and qualitative methods and techniques for problems and needs assessment. The most frequently used methods and techniques were reviewed and described by Abdel-Maksoud (2008 and 2010). The quantitative methods for needs assessment are based on measuring individuals' perception and evaluation of their knowledge, skills or abilities, attitudes, achievement, and the degree of importance of particular items. Data are gathered and processed, and items are ranked according to individuals' evaluation of their level of knowledge, skills, and the degree of importance of each item. They can be ranked also according to the discrepancy between importance and knowledge and the distribution of respondents on two dimensions (importance x knowledge or importance x achievement).

In 1980, Borich developed the following equation for training needs assessment:

Training need = (Importance – Knowledge) Average Importance

In 1984, Misanchuk developed Delta N statistic (Misanchuk, 1984). This method was employed by Pigg et al. (1995). Delta N can be computed by the following Formula:

$$\text{Delta N} = 1 - \frac{\sum_{i=1}^{R}\sum_{j=1}^{C} Wij\ Pij}{\sum_{i=1}^{R}\sum_{j=1}^{C} Wij\ Pi\ Pj}$$

Where Wij is the error weight for cell (i,j), Pij is the probability of a randomly sampled observation falling into cell (i,j), and Pi and Pj are the expected marginal probabilities for rows and columns respectively.

The method of computation of Delta N involves establishing cell values following the "proportionate reduction in error" approach developed for the analysis of cross-classified ordinal data. This approach predicts the probability of occurrence of certain combinations of joint distribution. The method is well explained in detail by Misanchuk (1984 and 1987). Suggested values for error weights for Delta N computation are shown in Appendix (1).

A modified Delta N method was developed by Abdel-Maksoud to avoid some drawbacks of Delta N and simplify its computation (Abdel-Maksoud, 2010). The modified Delta N can be computed by the following equation:

$$\text{The Modified Delta N} = 1 - \sum_{i=1}^{R}\sum_{j=1}^{C} Wij\ Pij$$

To understand the computation method of Delta N and the modified Delta N, the reader is referred to Abdel-Maksoud, 2010.

In addition to the above methods and techniques, there are several other methods which can be used for data collection and problems and needs assessment. Among these methods are: Delphi Technique, Scaled comparison, Key informants and supervisors interviews, Focus groups, Nominal groups, Observation (Formal and Informal personal observation), Meeting with individuals, and Informal group methods (Abdel-Maksoud, 2008). It is recommended to apply more than one method to assess problems and needs.

Objectives:

The main objectives of this paper were to:

1. Identify production and marketing problems facing sugarcane growers in Qena and Asswan governorates, Egypt.
2. Assess the identified problems using different methods and techniques of needs assessment.
3. Examine spatial differentials of perceived production and marketing problems among farmers in different villages i Qena and Asswan governorates.

Methodology:

In order to achieve the above objectives, an empirical research was conducted in three districts in Qena and Asswan governorates (two districts in Qena and one district in Asswan). Two villages were selected from the villages in each district. Focus groups of farmers were organized and held in one of these two selected villages, and a survey on a sample of farmers was conducted in the other village. The three districts, the six villages and the sample of farmers were randomly selected.

Nine focus groups were held in the three villages (three focus groups in each village). The total number of farmers participated in these focus groups was 91 farmers. Data gathered from members of these focus groups were used to identify production and marketing problems facing sugarcane growers in the research area. Nineteen production problems and sixteen marketing problems were identified by members of these focus groups. But the total number of problems included in this research was 27 production problems and 19 marketing problems as some other problems of which were identified in previous research (Abdel-Maksoud &,Elshrabassee, 2007 and Abdel-Maksoud, 2008) were added.

The total number of completed questionnaires from farmers was 262. Data were collected from sample members by means of personal interview using a questionnaire form prepared for this purpose. Table (1) gives some information of the cultivated area, the area of sugarcane, the number of farmers who participated in the focus groups, and the number of completed questionnaires from farmers in each village.

To assess the identified sugarcane production and marketing problems, farmers' evaluation of the degree of importance of each, their evaluation of evaluation of achievements or efforts devoted to solve each problem, the discrepancy between importance and achievement, Borich model, Delta N method, and the Modified Delta N method were applied. The top ten problems in each village were determined according to ranking results of Delta N and the Modified Delta N methods.

Results and Discussion:

Results of this research can be presented as follows:

First: Characteristics of farmers included in the

research:

1. Members of focus groups:

The total number of farmers who participated in focus groups was 91 farmers. Their ages ranged from 20 years to over 60 years and their level of education varied and included some illiterate farmers, some others who were able to read and write, and others who held preparatory, diploma of secondary, or a university degree. Most members were mainly farmers, others have taken agriculture as a secondary occupation. Their agricultural land holdings, and the area they grew of sugarcane ranged from less than one feddan to more than five feddans.

Table (1): Information concerning the research area

Govrernorate	District	Village	Cultivated area (feddan)	Area of Sugarcane (fedd.)	Total Number of farmers	Number of sugarcane growers	Method of data collection	Number Farmers paticipated
Qena	Qena	Elshaikh Eissa	875	337	630	300	Focus groups	32
		Alashraaf	4073	1011	750	270	Questionnaire	71
	Nagaa Hammady	Alraeiciah	2150	2058	2636	1600	Focus groups	27
		Alhefnawiah	769	672	800	745	Questionnaire	91
Asswan	Komombo	Alsabeil	4372	2600	1617	1507	Focus groups	31
		Kagog	904	322	301	301	Questionnaire	100

Source: Agricultural co-operative associations of the three villages.

2. Sample members:

Their ages ranged from less than 30 years to more than 70 years, and the majority of them were married living in families consisting of five to eight members or more. Their level of education varied from illiterate (15 %) to holding a university degree (6.5 %). But a large proportion of them (45.4 %) knew how to read and write. Agriculture was the principal occupation for most sample members (59.5 %), and over one quarter of them (26 %) were governmental employees. Most sample members (55.7 %) did not have any secondary occupation. Most of them (56 %) had less than two feddans of agricultural land, and 22 % of them had from five to ten feddans or more. Nearly three quarters of them grew less than two feddans of sugarcane, and 12.6 % of them grew five to ten feddans or more (Table 2).

Second: Identification of problems:

As stated before, the total number of problems included in this research was 27 production problems and 19 marketing problems. Table (3) includes a list of these identified production and marketing problems.

Third: Assessment of the identified problems:

In order to assess the identified problems in this research, six assessment methods and techniques were adopted. These are: importance, achievement, the discrepancy between importance and achievement, Borich model, Delta N method, ad the modified Delta N method. The adoption of these assessment methods has revealed to the following results:

1. Most assessment methods adopted gave similar ranking for most problems included in this research (Table 4).
2. There is a complete and positive correlation between Delta N and the Modified Delta N methods. Ranking results according to these two methods were used to determine the top ten problems in the three villages included in this research.
3. Marketing problems have dominated the top priorities of the identified problems.

   Among the top ten problems appeared in the three villages, there were seven marketing problems and three production problems in two villages (Alashraaf and Alhefnawiah villages in Qena governorate), and eight marketing problems and only two production problems in the village of Asswan governorate (Kagog). These problems were problems number: 45, 39, 37, 33, 42, 14, 41, 46,10, and 13 in Qena villages (Alashraaf and Alhefnawiah), ad problems number 41, 37, 39, 40, 42, 21, 43, 10, 45, and 44 in Asswan village (Kagog) (Table 4).

Table (2) Distribution of sample members according to their characteristics

Characteristics	Alhefnawiah	Alashraaf	Qagog	Total	%
1. Age:					
- Less than 30 years	6	-	-	6	2.3
- 30 -	16	7	7	30	11.4
- 40 -	22	19	30	71	27.1
- 50 -	9	18	23	50	19.1
- 60 -	21	16	30	67	25.6
- 70 or more	17	11	10	38	14.5
2. Marital status:					
- Single	2	1	2	5	1.9
- Married	85	65	94	244	93.1
- Widow	4	5	4	13	5.0
3. Family size:					
- Less than 5	38	12	22	72	27.5
- 5 – 7	43	32	56	131	50.0
- 8 or more	10	27	22	59	22.5
4. Education:					
- Illiterate	18	19	2	39	14.9
- Read & Write	32	21	66	119	45.4
- Primary and Preparatory	-	8	3	11	4.2
- Secondary	19	19	22	60	22.9
- Above average	8	3	5	16	6.1
- University	14	1	2	17	6.5
5. Principal occupation:					
- Farmer	45	54	57	156	59.5
- Employee	30	13	25	68	26.0
- Merchant	8	1	6	15	5.7
- Worker	8	3	12	23	8.8
6. Secondary occupation:					
- None	44	53	49	146	55.7
- Farmer	46	17	43	106	40.5
- Merchant	-	1	5	6	2.3
- Others	1	-	3	4	1.5
7. Agricultural land holding:					
- Less than one feddan	14	4	38	56	21.4
- 1 -	56	7	54	117	34.7
- 3 -	11	16	1	28	10.7
- 5 -	9	27	5	41	15.6
- 10 feddans or more	1	17	2	20	7.6
8. Area of sugarcane:					
- Less than one feddan	18	9	71	98	37.4
- 1 -	58	16	23	97	37.0
- 3 -	10	21	3	34	13.0
- 5 -	4	16	2	22	8.4
- 10 feddans or more	1	9	1	11	4.2

Source: Questionnaire forms

4. Low price of product and inaccuracy of weigh (problems number 37 and 39) were among the top three problems in the three villages.

5. Ranking results were similar in the two villages of Qena governorate, but there were obvious differences between the ranks in Qena villages and

Asswan village. While problems number: 13, 14, 33, and 46 appeared among the top ten problems in Qena villages and did not appear among the top ten problems in Asswan village, problems number: 21, 40, 43, and 44 appeared among the top ten problems in Asswan village and did not appear among the top ten problems in Qena villages.

6. In spite of similarities between the problems appeared among the top ten problems in the three villages, there were obvious differences in their ranking in the two governorates.

Table (3): Identified sugarcane production and marketing problems

Production problems	Marketing Problems
1. Shortage and high costs of fertilizers	28. Shortage and high wages of labour
2. Shortage and high costs of labour	29. Shortage of and irregular transportation means
3. Differences in planting dates	30. High costs of transportation
4. Non-growing in aggregates	31. Frequent accidents by tractors
5. Non-adoption of soil assessment	32. Unsystematic cutting
6. Non-adoption of subsoil ploughing	33. High costs of cutting
7. Non-adoption of levelling by laser	34. Delay of cutting
8. Non-adoption of recommended furrowing rate	35. Long period of cutting
9. Differences in crop rotation	36. Long period of non-irrigation of crop
10. Non-availability of new varieties	37. Low price of product
11. late planting	38. Steal of product during transportation
12. Shortage of irrigation water	39. Inaccuracy of weigh
13. High costs of irrigation	40. Long distance from factory
14. High costs of petroleum Products	41. The contract is controlled by the company
15. Over application of nitrate fertilizers	42. Delay of getting the value of product
16. Non-availability of phosphate fertilizers	43. High interest rate of loans
17. Spread of insects & diseases	44. High added expenses to loans
18. Spread of weeds	45. High ratio of defects
19. Over irrigation	46. Misuse of discounts from the value of product.
20. Non-cleaning of irrigation and drainage canals	
21. Small and fragmented holdings	
22. Non-availability of harvesting Machines	
23. Low productivity of C9 variety	
24. Non-availability of calcium sulphate	
25. Shortage of insecticides	
26. Weak extension services	
27. Spread of mice	

Source: Focus groups and previous research.

Table (4) Ranks of sugarcane problems in the three villages according to the results of different assessment methods*

Problem	Alashraaf village						Alhefnawiah village						Kagog village					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
1	15.5	25	24.5	24	24	24	7.5	24.5	16	14	24	24	4	28	21	17	24	24
2	11	22.5	19	17	18	18	4.5	13	7	7	18	18	9.5	20	16	15	17	17
3	38.5	40	41	41	40	40	31.5	24.5	26	26	40	40	22	38	37	37	37	37
4	40.5	44.5	43	43	44	44	44	27	33	35	44	44	38	35	34	33	35	35
5	33	11	13	14	15	15	46	6	19	21	15	15	43.5	14	23	26	22	22
6	21	36	34	34	37	37	27	18	21	20	37	37	35	19	25	27	25	25
7	36.5	33	33	33	34	34	24.5	12	15	16	34	34	31.5	25.5	27.5	29	26	26
8	33	41	40	40	41	41	37	34	41	42	41	41	30	44	41	41	43	43
9	30	31.5	30	30	31	31	45	29	37	38	31	31	42	42	42	42	42	42
10	24.5	3	8	9	9	9	39	1	3	4	9	9	12	9	7	7	8	8
11	27.5	34.5	35	35	35	35	33.5	36	43	43	35	35	21	40	38	38	38	38
12	19	17	18	19	17	17	19.5	44	42	41	17	17	26	46	45	45	46	46
13	11	9	10	10	10	10	17	40	35.5	36	10	10	38	41	40	40	40	40
14	9	4.5	6	6	6	6	22	5	5	6	6	6	45	18	33	35	33	33
15	44	42	42	42	42	42	21	46	46	46	42	42	33.5	39	39	39	39	39
16	30	26	27	27	27	27	31.5	22	23	23	27	27	33.5	45	43	43	41	41
17	13.5	18.5	17	16	16	16	14	14	12.5	13	16	16	9.5	30	27.5	25	28	28
18	13.5	16	15	15	14	14	11	17	10	12	14	14	7.5	30	26	24	29	29
19	42.5	44.5	44	44	43	43	42	37	44	44	43	43	38	43	44	44	44	44
20	38.5	38	38	38	38	38	17	32	28	29	38	38	31.5	37	36	36	36	36

Table (4) Continued: Ranks of sugarcane problems in the three villages according to the results of different assessment methods

Problem	Alashraaf village						Alhefnawiah village						Kagog village					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
21	27.5	14	16	18	19	19	43	7	18	19	19	19	7.5	6.5	6	6	6	6
22	21	12	12	12	13	13	33.5	15.5	22	22	13	13	36	13	15	20	13	13
23	30	24	24.5	25	26	26	23	28	27	25	26	26	13.5	15	13	11	14	14
24	42.5	29.5	32	32	30	30	26	15.5	20	18	30	30	40	6.5	10	14	11	11
25	24.5	31.5	29	29	29	29	13	41	31	31	29	29	23.5	32	30	30	30	30
26	24.5	37	36	36	33	33	12	45	35.5	34	33	33	26	33.0	31	31	31	31
27	17	28	26	26	25	25	9	19.5	9	9	25	25	16	25.5	22	22	23	23
28	15.5	22.5	20	20	20	20	3	26	11	8	20	20	11.0	24	18	18	20	20
29	33	39	39	39	39	39	7.5	39	29	28	39	39	41	30	32	32	32	32
30	8	13	11	11	11	11	4.5	23	12.5	10	11	11	43.5	34	35	34	34	34
31	46	46	46	46	46	46	17	38	34	33	46	46	46	36	46	46	45	45
32	36.5	27	28	28	28	28	35	33	38	37	28	28	15	23	19	19	19	19
33	4	6	4	4	4	4	6	8.5	6	5	4	4	13.5	16	14	12	15	15
34	18	21	22	21	23	23	28.5	31	32	32	23	23	19	22	20	21	18	18
35	21	20	23	23	22	22	40	42	45	45	22	22	26	21	24	23	21	21
36	24.5	18.5	21	22	21	21	41	30	39	40	21	21	17	17	17	16	16	16
37	1	4.5	3	3	3	3	1	4	2	2	3	3	3	3	2	2	2	2
38	45	43	45	45	45	45	19.5	43	40	39	45	45	28.5	27	29	28	27	27
39	2	2	2	2	2	2	2	2	1	1	2	2	2	4	3	3	3	3
40	11	15	14	13	12	12	15	35	30	30	12	12	6	2	4	4	4	4

Table (4) Continued: Ranks of sugarcane problems in the three villages according to the results of different assessment methods

Problem	Alashraaf village						Alhefnawiah village						Kagog village					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
41	7	8	7	7	7	7	30	11	17	17	7	7	1	1	1	1	1	1
42	5	7	5	5	5	5	24.5	8.5	8	11	5	5	5	5	5	5	5	5
43	35	34.5	37	37	36	36	36	21	25	27	36	36	19	8	8	8	7	7
44	40.5	29.5	31	31	32	32	38	19.5	24	24	32	32	23.5	11	11	10	10	10
45	3	1	1	1	1	1	10	3	4	3	1	1	19	10	9	9	9	9
46	6	10	9	8	8	8	28.5	10	14	15	8	8	28.5	12	12	13	12	12

Source: Determined from data in Appendix (2).

*1 = Ranking according to mean importance, 2 = " '' '' " achievement,

3 = " '' '' (Importance x Achievement), 4 = " '' '' Borich value,

5 = " '' '' Delta N value, 6 = " '' '' The Modified Delta N value

Conclusion:

Based on the above results, it can be concluded that sugarcane growers in Qena and Asswan governorates face various problems. Marketing problems are the most perceived problems. Spatial differences exist among farmers in these two governorates in their perception and evaluation of sugarcane production and marketing problems. The extension system should be aware of such differences and plan its extension programmes and activities on the basis of problems identification and assessment in each area using effective and precise assessment methods and techniques.

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Appendix (1): Suggested Error Weights for Computing Delta N

	Importance*				
Achievement*	1	2	3	4	5
1	0.7071	0.5303	0.3536	0.1768	0.000
2	0.7289	0.5590	0.3953	0.2500	0.1768
3	0.7906	0.6374	0.500	0.3953	0.3536
4	0.8839	0.7500	0.6374	0.5590	0.5303
5	1.000	0.8839	0.7906	0.7289	0.7071

Source: Misancuk, 1984: 30.

- Both importance and achievement are measured on a five point Likert-type scale ranging from 1 (very low) to 5 (very high). Values in the body of the Table show the error weigh. If all respondents fall in the cell (1,5) where their level of competence is very low and the degree of importance of the item is very high, the error will equal zero, and if all respondents fall in the cell (5,1) where their level of competence is very high and the degree of importance is very low, the error will equal one. The error weights increase as one moves through any direction from cell (1,5) t0 cell (5,1)

Appendix (2): Results of the application of different assessment methods on sugarcane production and marketing problems*

Problem	Alashraaf village						Alhefnawiah village						Kagog village					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
1	4.07	2.14	1.93	7.86	5007.	7199.	4.04	2.79	1.25	5.07	.5007	7199.	4.53	2.76	1.77	8.02	4057.	6666.
2	4.13	1.99	2.14	8.84	5415.	7428.	4.08	2.57	1.51	6.14	5415.	7428.	4.37	2.48	1.89	8.26	4474.	6900.
3	3.90	2.91	99.	3.86	2756.	5936.	3.57	2.79	78.	2.79	2756.	5936.	4.23	3.66	57.	2.41	1009.	4956.
4	3.86	3.13	73.	2.82	2078.	5556.	3.32	2.97	35.	1.17	2078.	5556.	4.01	3.07	94.	3.77	2075.	.5554
5	3.94	1.51	2.43	9.57	5742.	7611.	3.20	2.11	1.09	3.48	5742.	7611.	3.90	2.19	1.71	6.67	4175.	6732.
6	4.00	2.65	1.35	5.40	3547.	6380.	3.68	2.67	1.01	3.72	3547.	6380.	4.08	2.47	1.61	6.57	3870.	6561.
7	3.92	2.54	1.38	5.41	3595.	6407.	3.73	2.46	1.26	4.71	3595.	6407.	4.11	2.56	1.55	6.37	3783.	6512.
8	3.94	2.94	1.00	3.94	2724.	5918.	3.51	3.32	19.	65.	2724.	5918.	4.15	3.90	25.	1.04	0030.	4407.
9	3.96	2.38	1.58	6.26	4050.	6662.	3.30	3.05	24.	80.	4050.	6662.	3.96	3.78	18.	71.	0066.	4427.
10	3.99	1.17	2.82	11.25	6520.	8048.	3.47	1.18	2.30	7.98	6520.	8048.	4.35	2.00	2.35	10.22	5561.	7510.
11	3.97	2.63	1.34	5.32	3585.	6401.	3.55	3.40	15.	55.	3585.	6401.	4.24	3.69	55.	2.33	0766..	4820.
12	4.01	1.86	2.15	8.62	5421.	7431.	3.80	3.63	18.	67.	5421.	7431.	4.19	4.19	00.	00.	-.068	4008.
13	4.13	1.42	2.71	11.19	6462.	8015.	3.81	3.52	30.	1.13	6462.	8015.	4.01	3.74	27.	1.08	0412.	4621.
14	4.15	1.20	2.95	12.24	6984.	8308.	3.75	1.95	1.80	6.75	6984.	8308.	3.43	2.46	97.	3.33	2276.	5667.
15	3.83	3.04	79.	3.03	2230.	5641.	3.79	4.07	-.27	-1.0	2230.	5641.	4.09	3.68	41.	1.68	0651.	4755.
16	3.96	2.17	1.79	7.09	4633.	6989.	3.57	2.75	82.	2.94	4633.	6989.	4.09	3.92	17.	70.	0171.	4486.
17	4.10	1.92	2.18	8.94	5624.	7545.	3.90	2.59	1.31	5.10	5624.	7545.	4.37	2.82	1.55	6.77	3590.	6404.
18	4.10	1.85	2.25	9.22	5806.	7647.	3.98	2.66	1.32	5.25	5806.	7647.	4.39	2.82	1.57	6.89	3570	6393.
19	3.85	3.13	72.	2.77	2096.	5566.	3.38	3.45	-.07	-.22	2096.	5566.	4.01	3.88	13.	52.	-.011	4330.
20	3.90	2.70	1.20	4.68	3355.	6272.	3.81	3.25	.56	2.14	.3355	.6272	4.11	3.33	78.	3.21	1695.	5341.

Appendix (2) Continued: Results of the application of different assessment methods on sugarcane production and marketing problems

Problem	Alashraaf village						Alhefnawiah village						Kagog village					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
21	3.97	1.76	2.21	8.77	5387.	7412.	3.35	2.23	1.12	3.76	5387.	7412.	4.39	1.90	2.49	10.93	6037.	7777.
22	4.00	1.55	2.45	9.80	5886.	7692.	3.55	2.62	93.	3.32	5886.	7692.	4.06	2.16	1.90	7.71	4816.	7092.
23	3.96	2.03	1.93	7.64	4840.	7105.	3.74	2.99	75.	2.79	4840.	7105.	4.34	2.33	2.01	8.72	4813.	7090.
24	3.85	2.34	1.51	5.81	4078.	6678.	3.69	2.62	1.08	3.98	4078.	6678.	4.00	1.90	2.10	8.40	5057.	7227.
25	3.99	2.38	1.61	6.42	4308.	6807.	3.95	3.55	40.	1.56	4308.	6807.	4.20	2.83	1.37	5.75	3405.	6300.
26	3.99	2.66	1.33	5.31	3645.	6435.	3.97	3.67	30.	1.18	3645.	6435.	4.19	2.87	1.32	5.53	3232.	6203.
27	4.06	2.23	1.83	7.43	4872.	7123.	4.02	2.68	1.34	5.39	4872.	7123.	4.30	2.56	1.74	7.48	4111.	6696.
28	4.07	1.99	2.08	8.47	5362.	7398.	4.12	2.80	1.32	5.43	5362.	7398.	4.36	2.55	1.81	7.89	4296.	6800.
29	3.94	2.85	1.09	4.29	3123.	6142.	4.04	3.49	55.	2.22	3123.	6142.	3.99	2.82	1.17	4.67	2952.	6046.
30	4.18	1.68	2.50	10.45	6057.	7788.	4.08	2.77	1.31	5.33	6057.	7788.	3.90	3.00	90.	3.51	2128.	5584.
31	3.69	3.27	42.	1.55	1504.	5234.	3.81	3.47	34.	1.30	1504.	5234.	3.01	3.30	-.29	-.87	-.050	4110.
32	3.92	2.21	1.71	6.70	4428.	6874.	3.53	3.30	.23	.81	.4428	.6874	4.33	2.52	1.81	7.84	4364.	6838.
33	4.35	1.23	3.12	13.57	7553.	.8627	4.07	2.31	1.76	7.15	7553.	8627.	4.34	2.40	1.94	8.42	4692.	7022.
34	4.03	1.97	2.06	8.30	5155.	.7282	3.63	3.24	38.	1.39	5155.	7282.	4.28	2.50	1.78	7.62	4367.	6840.
35	4.00	1.94	2.06	8.24	5180.	.7296	3.46	3.57	-.11	-.38	5180.	7296.	4.19	2.49	1.70	7.12	4273.	6787.
36	3.99	1.92	2.07	8.26	5248.	.7334	3.40	3.18	22.	75.	5248.	7334.	4.29	2.42	1.87	8.02	4645.	6996.
37	4.55	1.20	3.35	15.24	7927.	.8837	4.18	1.86	2.32	9.68	7927.	8837.	4.56	1.67	2.89	13.18	7080.	8362.
38	3.70	3.06	64.	2.37	2070.	.5551	3.80	3.60	20.	75.	2070.	5551.	4.16	2.62	1.54	6.41	3754.	6496.
39	4.54	1.14	3.40	15.44	8255.	.9021	4.14	1.54	2.60	10.79	8255.	9021.	4.58	1.71	2.87	13.14	7043.	8341.
40	4.13	1.77	2.36	9.75	5893.	.7696	3.86	3.34	52.	1.99	5893.	7696.	4.41	1.65	2.76	12.17	6717.	8158.

Appendix (2) Continued: Results of the application of different assessment methods on sugarcane production and marketing problems

Problem	Alashraaf village						Alhefnawiah village						Kagog village					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
41	4.24	1.41	2.83	12.00	6904.	.8265	3.59	2.40	1.20	4.30	6904.	8263.	4.60	1.42	3.18	14.63	7809.	8771.
42	4.34	1.37	2.97	12.89	7207.	.8433	3.73	2.31	1.42	5.28	7207.	8433.	4.44	1.78	2.66	11.81	6492.	8032.
43	3.93	2.63	1.30	5.11	3561.	.6388	3.52	2.73	79.	2.78	3561.	6388.	4.28	1.99	2.29	9.80	5670.	7571.
44	3.86	2.34	1.52	5.87	4012.	.6641	3.48	2.68	80.	2.79	4012.	6641.	4.20	2.11	2.09	8.78	5191.	7302
45	4.52	1.10	3.42	15.46	8258.	.9023	3.99	1.75	2.24	8.94	8258.	9023.	4.28	2.05	2.23	9.54	5515.	7484.
46	4.28	1.50	2.78	11.90	6863.	.8240	3.63	2.32	1.31	4.74	6863.	8240.	4.16	2.14	2.02	8.40	5030.	7212.

Source: Calculated from data collected by questionnaires

*1 = Mean importance,

2 = " achievement,

3 = Importance x Achievement

4 = Borich value,

5 = Delta N value,

6 = The Modified Delta N value

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