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Using Dichotomous Distribution to Assess the Efficiency and Social Modeling of Agricultural Extension Projects in the Islamic Republic of Iran

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ABSTRACT

There is undoubtedly general agreement that the efficiency of educational investments should he maximized through the managerial process as far as possible. Agricultural extension is one of the crucial tasks in developing agricultural societies calling for considerable consumption of intellectual investment. The management of agricultural extension projects (AEPs) however, needs careful planning in utilizing this investment specially in terms of meeting the right clientele. This paper reports on the use of a statistical device which can be applied for planning the social modeling of agricultural extension programs. This statistical device, the so-called Dichotomous Distribution of the Extension Clientele (DDEC) was designed and used by the author to determine the social modeling of agricultural extension projects in Iran and the degree to which the extension projects have been successful in reaching their target clientele. The procedure consisted of four major criteria: farmers, educational needs, participation in AEP: access to utilities needed for adoption and utilization of the innovation (advice given by the extension agents). As a result of using this method and interviewing 912 farmers throught 57 randomly selected AEPs, it was found that 66 percent of the projects in 1988 and 60 percent in 1989 were thoroughly efficient, and 16 percent in 1988 and 12 percent in 1989 were efficient. Four projects in each year were found to have a very low efficiency rate while one project in 1988 and four projects in 1989 were inefficient in terms of their social modeling. This procedur has been applied to study the social modeling along with the efficiency of the extension projects dealing with the biological control of rice stenborer in eastern part of Mazandaran province where rice is the dominant cash crop. Acording to this result obtained from the recent research projects, it was shown that the less differences among the number of trained farmers and the target groups the more efficient were the extension project In addition, there was statistically significant difference among those of target groups and none target groups in term of applying the extension boicontrol guidlines in rice production practices. The related extension projects were also efficient (r=0.73) in term of their social modelings.

Keywords: Agricultural extension , Target groups , Extension projects , Social modeling.

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INTRODUCTION

Agricultural extension is, by design, responsive to clientele demands and relies on their voluntary participation. Those farmers least inclined to seek assistance have not been

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served as well as those who have been motivated to and able to ask for and utilize the program [11].

The solution may be found in the careful study of planning for a more effective service. The point is thai someone outside the process can often help to frame the question and thus improve the value of the answer. Extension can use its understanding of broad sociocconomic trends and its experience with them to help community decision makers ask the right question in terms of extension efficiency and /or effectiveness [12]; that is, how responsive and effective has extension been in identifying and serving clientele and in providing new programs for new social and economic problems and priorities [11]?

Efficiency is easily measured by computing the ratio of output to input. Alternatively, effectiveness is not easily measured and is even less easily defined. It focuses on "doing the right things" rather than "doing things right". It seems logical that to do the right thing the clientele for an extension program should be identifiable and identified [9j. Another point is that in extension programs, program planners should consider and contribute to agricultural productivity as well as (he human development of their clientele and iheir acquisition of more effective living skills [13]. To respond to both dilemmas, extension specialists and administrators should improve the quality of the social modeling of AEPs.

In fact, before running an AEP, it is important to determine which sector in rural, or even urban areas, benefits from the project in order to find out how extension sets its projects, directions to meet the needs of the people. Or, more specifically, how agricultural extension activities may be directed to handle the right section of society. Intellectually, this kind of socio-technical endeavor has to be handled seriously, especially when sometimes extension does not receive enough funds. Tight budgets, hiring freezes, and even layoffs are the reality for today's extension service.

Today's extension clientele are wider, more sophisticated, and more demanding. A theme receiving considerable emphasis is that of marketing extension, making what we do and how we do it visible, particularly to those with influence on our budgets [3].

The question to be answered is; "How do we survive, much less flourish, in times of limited resources?" [3], Good extension marketing plans also include efforts to understand the clientele. However, extension has neglected this essential marketing step for two reasons. First, promotion is often erroneously considered to be synonymous with marketing. Knowing your customer is frequently overlooked in the rush to promote extension programs. Second, because extension is an older agency, we tend to believe that after all these years we know our clientele [4].

This study was conducted to allow extension administrators and program planners to gain a suitable understanding of social modeling and its influence on program effectiveness. Also, in this article, matching theories of management and organization [7,9], with research methods in agricultural extension produces a model to assess AEPs and the direction these projects may take in society regarding their economical efficiency.

MATERIALS AND METHODS

Target Group Criteria

Target group criteria are the basic factors identifying a specific social group and distinguishing if from other groups. These kinds of criteria should be identified in extension programs to let agents serve the right people. Determinant group criteria are those which are related to the accomplishment of project goals. In ejeh case, determinant group criteria are clearly set up to define a specific population

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in an AEP for the sake of the efficient and effective delivery of extension program planning to the clientele. These criteria also make it easier to prepare research designs and assessment tools to study AEP outcomes. To choose the appropriate criteria, it is important to consider their totality, sensitivity, generality, limits and easiness [6|.

One considerable dilemma in designing an evaluation system is determining the sources of the rural development outcomes. These outcomes are usually found through four sources as the projects' general goals, basic goals, the experimental group and finally, their basic needs [6]. Since all those who live and work in rural areas are obviously not relevant for all AEPs, but mostly participate in these projects along with the right clienteles just for fun and regardless of their professional interest, it is therefore vital to come up with clear criteria to identity the proper target groups, However, in societies under the extension projects there are actually two groups of clienteles that can be recognized; the first group comprises of those who are a truly relevant clientele and second those who, regardless of not being a relevant clientele, participate in extension projects merely for fun. In this study, the first group is considered as experimental, and the second group is taken as a control. Obviously, all members of both groups were working at the same job (i.e. growing wheat, barley, alfalfa, vegetables, fruit, and so on). At the same time, the component of the modeling criteria lor grouping them, was prepared in a way that they could be considered as the experimental units. The criteria selected in this research were as follows:

1. Relevance of the AEP to the professional needs of the participants.
2. Participation in the AEP.
3. Access to the facilities (utilities) needed by participants to apply innovations.
4. Application of the innovations.

So far, only four criteria were used in modeling extension clients, hence, in total, 16 cases were recognized with the probability of P=0.0625 for each, based on binominal distribution [5]. Each one of these criteria is described as fllows:

Participation

The first factor which was considered in grouping the extension clientele was their participation in extension trainig projects. In this case, the subject clientele was divided into two groups in any rural area under study. Firsl, those who participated in the project and second, those who did not.

Utilities

Another factor, which played an important role in social modeling in this study, was access to the utilities needed by the participants to apply the innovations. For this, the clientele was also divided into two groups: first, those who could prepare the utilities needed and second, those who could ot afford additional utilities to adopt the innovations offered through the AEP. Using the above two criteria together, four experimental groups were formed as shown in Table 1.

Table 1. Grouping AHP clientele based on Ihcir participation and utilities needed"

Par	Util +	Util -
+	1	3
-	2	4

Group I consists of those clienteles that **participated** in the AEP and could afford the utilities needed to apply the innovations. Group 2 are those who already had access to the **utilities** needed but did not participate in the AEP. Group 3 are those who participated in the AEP but could not afford utilities needed for adoption; and finally group 4 are those who neither participated in the AEP nor had access to the utilities needed.

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Training Needs

Basically, the subject and content of the AEP should be devised such that professional needs of the clientele are met. Also, the voluntary participation of the clientele is a fundamental principle in extension education as the very first motive. Essentially, when only the training needs for an AEP were considered, the extension clientele was divided into two groups: first, those who needed training, and second those who felt no training was needed for that specific AEP. Again four groups of clientele were recognized as the result of putting participation and training needs together as shown in Table 2.

Table 2. Grouping AHP clientele based on their participalion and professional needs.

	Util	
Par	+	-
+	1	3
-	2	4

Adoption

Adopting the innovation offered by the extension agents in any case would be among those factors which can affect farm products. Of course, usually not all of those who participated in AEPs (regardless of the reason) adopted the innovations offered (even adoption at low rates was considered a successful AEP in this study). As the result of interacting adoption with participation, again four groups of clienteles were identified as shown in Table 3.

Table 3. Grouping AEP clientele based on their participation and adoption

	Adop	
Par	+	-
+	1	3
-	2	4

Social Modeling

In order **to** approach the basic goals of this research, it was necessary to use a design showing the normal grouping of the relevant clientele arising from the interaction of four criteria at the same time. Thus, as a result of the interaction, 16 cases were recognized.

As shown in Table 4, the results of the normal grouping of the extension clientele, based on the criteria discussed above, created 16 totally different groups. The characteristics of each group may be determined by the relevance or attribution of each criterion to them. Meanwhile, the probability for each one of the 16 cases would be 1/16 |5].

Since factors influencing the grouping of the clientele, in each subject AEP, followed a normal binominal distribution pattern (accommodating for the situation of the population under this study) combination of binominal distribution of T was used (frequency of the factor in the population X its normal probability in the society) [13]. In this distribution though, T=16, N=4 and p = l / N = l/16=0.0625 in case each one of the four criteria was involved.

Table 4. Binominal distribution of AEP clientele based on selected four criteria

Group	Participation	Access to Utilities	Education Needed	Adoption
1	+	+	+	+
2	+	+	+	-
3	+	+	-	+
4	+	+	-	-
5	+	-	+	+
6	+	-	+	-
7	+	-	-	+
8	+	-	-	-
9	-	+	+	+
10	-	+	+	-
11	-	+	-	+
12	-	+	-	-
13	-	-	+	+
14	-	-	+	-
15	-	-	-	+
16	-	-	-	-

Table 5. Number of cases and their probability based on ihe number of criteria involved

Criteria	Cases	Probability
4	1	0.0625
3	4	0.2500
2	6	0.3750
1	4	0.3500
0	1	0.0625

Assuming nine experimental units among 16 units from the same area need an AEP, based on the extension equation (i.e. presenting educational guidelines to meet the needs of the clients according to the utilities available to them) it should be expected that at least nine experimental participants adopt innovatios. Then P«—**-0.5625.** In fact, in a symmetric population, when in the distribution of T=4, the probability of building each one of the 16 cases will be P=0.0625, naturally the standard probability of the target experimental units, in the area population, will be P=0.0625. On the other hand, the probability of bringing up each single model in a uniform population is $P_2=\frac{}{n_2}$ in which n_2 is the number of experimental units which require training. To test the hypothesis in this study, (H; $P_1 < P_2$) the standard score test was used through the following formula **[13]:**

$$\frac{}{\left(\sqrt{P(1-P)}\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}\right)}$$

in which:

$$P=\frac{X+Y}{n_1+n_2},\ P_1=\frac{Y}{n_1},\ P_2=\frac{X}{n_2}$$

and, X is the number of target clienteles in the sample; n_l is the sample size (n = 16 in a symmetric population): Y is the number of clientele in each one of the rural areas known' as the target clientele: and n_2 is the number of the subject clientele under the same subject AEP. Results from this part of the study are shown in Table 6.

Also, to calculate the efficiency coefficient the following equation was applied:

$$r=1-\frac{n_1-n_2}{N}$$

In this equation, r is the efficiency coefficient; nj is the number of farmers who needed AEP training; n_2 is the number of the target clientele; and finally, N is the number of farmers interviewed in each subject AEP. Table 8 shows AEPs social modelin efficiency coefficients.

RESULTS AND DISCUSSION

Results from utilizing the Z test to compare the number of respondents who needed AEP training with the frequency of the target respondents are presented in Table 6. At the second stage, the hypothesis of the population being asymmetric under a certain AEP, that is, comparing the number of target clienteles in social modeling in each AEP wiht normal cases (when basic criteria are homogeneous and the population is symmetric), was tested. To approach this goal, the probability of the target group who participated in the AEPs was studied (the number of experimental units in the symmetric population under a normal situation was taken as a control group and the number of those under each AEP as the experimental). Results from this part of the study are also presented in Table 6 under Z based on the years of the study. As shown in this table, at the first stage, the hypothesis for those AEPs in rows: 12, 15, 18, 20, 30, 46, 48, 56, 57 and 63 in 1988, and AEPs in rows: 7, 9, 12, 15, 18, 27, 29, 30, 34, 36, 46, 48, 56, 57, and 63 in 1989 were rejected. Hence, it was proved that at P=0.05, the probability of target clienteles being among AEP participants was less than that for those who needed AEP training, specially when the number of clienteles covered by

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ihe AEPs was small. Therefore, target clients in the rest of the AEPs in Table 6 wre statistically facing the same probability as those who needed AEP training. This suggests that the **efficiency** of social modeling for the relevant AEPs should be high.

At the next stage, due to testing the second stndard score or Z, results also showed that the hypothesis that the population under certain AEPs is symmetric was tested and as a result of this the hypothesis concerning AEPs in rows: 1, 6, 7, 12, 14, and 20 in 1988 and AEPs in rows: 1, 7, 9, 12, 14, 20, 37, 38, 40, 43, 48, and 56 in 1989 was rejected at P=0.05. Therefore, statistically it was accepted that the probability of target clienteles participating in an AEP was the same as the probability of normal binominal distribution.

Obviously, this latter point had some shouncomings in the social modeling of those projects due to the limited number of target clienteles who participated. Or in other words, the relevant AEPs were actually lacking in efficiency. However, at the same time, the hypothesis of asymmetry for the population under AEPs (at least, because of the larger number of the target clienteles rather than their frequency in normal binominal distribution) for the rest of the AEPs was accepted. Of course, recent findings can play an effective role in increasing the efficiency ratio of the social modeling for related AEPs. Actually, according to the information in Table 6, 74 percent of the AEPs in 1988 and 74 percent in 1989 were homogeneous in terms of the basic social modeling criteria.

To study the homogeneity of the criteria used in the AEPs social modeling and also assess the balance of this modeling, participants with good access to utilities needed to adopt innovations were considered as the control group, and those who participated in an AEP training session and adopted innovations received from extension agents were taken as the experimental group in utilizing the X^2 (goodness of fit) test.

Results from this part of the study are given in Table 7 under the heading of X^2 . The same test was also utilized to assess the balance between basic social modeling in AEPs and to compare the frequency of the clienteles in different groups under AEPs as the control group and the frequency of other basic criteria as the experimental group.

In fact, if the AEPs were modeled in a proper way so as to meet the right target group prior to being exposed to the clienteles, then they should be more efficient in terms of covering more relevant groups rather than just being exposed to the masses. It should be noted that under those circumstances, joining four criteria together is not highlighted, although it should be the main focus of an AEP as will be discussed later.

Moreover, the first and second X^2 values, with df=3 and P=0.025 should be greater than 4.11 in order to accept the hypothesis of the difference between the probability of involving each criteria.

But, regarding data in Table 7, all cases under *x]* and x* (except the AEP in row 12 in 1988) were smaller than 4.11. Therefore, the hypothesis was not accepted and, as a result, the assumption of equal frequencies for each criterion was adopted. On the other hand, in all cases except one, each criterion involved in the population in such a way that no significant difference existed between its frequency and the frequency of the population needing AEP training, was reported.

This procedure has been applied to study the social modeling along with the efficiency of the extension projects, dealing with the biological control of rice Stenborer in eastern part of Mazandaran province, where rice is the dominant cash crop. In this area, there were about 1215 rice growers in which 160 of them were randomly selected for this investigation. In order to evaluate the social

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Table 6. Comparing frequency of AEP clientele needing AEP training and target clienteles based on AEP subject, project area and year of the study

Row	Subject	Area	Z_1		Z_2		Row	Subject	Area	Z_1		Z_2	
No.	AEP		1988	1989	1988	1989	No.	AEP		1988	1989	1988	1989
1	Wheat	Broojen	-24	-243	1.14*	1.14*	32	Total		202	1.77	3.98	3.23
2		Bojnurd	3.7	1.86	4.15	3.19	33	Cotton	Turkman	6.09	4.9	4.93	438
3		Ardebil	4.03	3.83	4.63	4.13	34	Sunflower	Bojnurd	1.86	.26*	3.19	2.24
4		Salmass	3.04	3.24	3.84	3.95	35	Soya		279	284	3.13	3.06
5		Dashtestan	4.63	4 63	5.31	4.94	36		Bojnurd	1.86	1.53*	224	244
6		Malier	3.04	2.43	224*	1 14	37		Ghomshed	-3.7	-3.7	04	.04*
7		Kurdkuy	1.71	1.31*	1.54*	1.54*	38	Fruit	Brujen	-3.7	-3.89	.04	(1*
8		Total	6.79	5.66	4.13	3.54	39	Pistachio	Damghan	3.89	3.24	4.27	3.95
9	Barley	Bandar	243	0*	3.51	1.11*	40	Citrus	Bamm	-3.24	3.89	.5	.5*
		Abbas					41	Dale	Dashtestan	4.62	4.62	5.31	5.31
10		Marvdashl	3.05	2.43	3.51	3.19	42	Almond	Esfarien	3.89	2 07	3.95	3.34
II		Sarab	3.04	2.63	3.19	3.3	41	Pomegranate	Mehriz	-3.89	-4.43	-1.01	-98*
12		Kurdkuy	-.38*	-.83*	.62*	.75*	44	Apricot	Esfarien	1.64	2.07	3.69	3.65
13		Total	4.64	272	3.61	3.04	45	Apple	Firuzabad	3.89	3.24	3.65	3.05
14	Rice	Lordegan	-3.7	-3.7	.04*	04*	46		Ghomsheh	-1.01*	-1.01*	213	213
15		Gonabad	4.63*	4.63*	4.27	4 6	47		Total	1.81	1.43	3.16	2.81
16		Total	.54	M	4.27	4.6	4X	Grape	Firuzabad	-1.01*	1.01*	0	-1*
17	Beans	Brujerd	243	263	3.51	3.65	4')		Brujerd	263	263	4.27	4.27
IX		Ghomsheh	1.01*	1.01*	3.34	3.34	50		Total	1.07	1.07	264	247
19		Total	2.43	2.59	3.8	3.89	51	Cow	I UIILIII	3.63	3.63	4.39	4.39
20	Alfalfa	Bamm	-1.01*	-2.63	1.46*	.606*	52		Sarah	2.63	3.63	3.95	4.39
21		Malier	3.04	3.04	257	2.57	.S3		Marard	-3.89	263	-1.01	3.95
22		Total	1.27	.18	217	IK	54		Tolal	1.08	.77	3.14	3.14
23	Potalo	Bandar	3.24	3.04	3.95	3X7	55	Sheep	Esfarien	3.24	3.24	3.24	3.24
		Abbas					56		Mehriz	1.53*	-.5*	1.46	2.4*
24		Sarab	3.89	4.23	4.6	4 74	57		Damghan	1.01*	1.01*	275	2.44
25		Total	5.47	5	4.93	5.14	58		Total	1.46	2.07	2.86	3.1
26	Eggplant	Bandar	4.63	4.63	5.31	5.31	59	Goat	Kohkiluyeh	4.43	4.43	4.84	4.84
		Abas					60	Honey	Dehdasht	4.43	4.43	4.49	4.15
27	Onion	Bandar	4.62	1.08*	4.94	2.7	r.i	Dairy	Marvdashl	4.43	3.7	4.84	4.49
		Abas						Sanitation					
28	Tomato	Minab	3.89	3.24*	4.6	427	62		Esfarien	3.24	263	4.27	4.27
29	Vegetable	Firuzabad	3.7	-.26	4.84	2.75	63		Sal mas	1.31*	1.31*	3.51	3.51
30	Sugar Beet	Marvdashl	.63*	.2*	3	1 S|	64		Total	5.51	4.63	5.24	5.05
31		Salinas	2.07	2.07	3.95	3.95							

Table 7. Comparing frequency of key criteria with AEP clientele needing training (A) and mean frequency of key criteria.

Row No.	Subject AEP	Area	X_1^2 1988	X_1^2 1989	X_2^2 1988	X_2^2 1989
1	Wheat	Broojen	0	0	0	0
2		Bojnurd	.025	.008	.025	.005
3		Ardebil	.017	.04	.005	Old
4		Sal mass	.035	.03	.032	027
5		Dashlestan	0	.003	0	.38
6		Malier	.308	.275	.266	.38
7		Kurdkuy	.26	.26	.277	.277
8		Total	.042	.035	.035	.fas
9	Barley	Bandar Abbas	.013	1.5	.013	.8
10		Marvdasht	.017	.034	.016	.031
11		Sarab	.076	.09	.048	083
12		Kurdkuy	2	4.35*	.875	1.017
13		Total	.041	.122	.042	.103
14	Grape	Firuzabad	1.16	1.41	1 (.2	21X
15		Brujen	.023	.023	016	.016
16		Total	.138	.163	.133	1S7
17	Cow	Fumann	.016	.016	000	,009
18		Sarab	.065	.059	061	04"
19		Marard	2	0	2	0
20		Total	.03	.024	.03	024
21	Sheep	Esfarien	.066	.066	.Of) 7	0 67
22		Mehriz	.04	.02	.027	.014
23		Sc in ii.ni	.22	.27	.148	.214
24		Total	.078	.08	.068	.074
25	Goat	Kohkiluyeh	.008	.008	004	.00-1
26	Honey	Dehdasht	.017	.023	.014	,013
27	Dairy Sanitation	Marvdashl	.004	.01	.003	004
28		Esfarien	.01	.004	.004	.1117
29		Sal mass	.25	.25	.148	.148
30		Total	.025	.039	017	.018
31	Hay	Sarab	0	0	0	II
32		Turkman	.045	.36	.018	07
33		Total	.01	.068	.002	016
34	Pastine	Kohkiluyeh	.295	.295	.14	.14

Row No.	Subject AEP	Area	X_1^2 1988	X_1^2 1989	X_2^2 1988	X_2^2 1989
35	Cotton	Turkman	.015	.021	.011	Oil
36	Sunflower	Bojnurd	.074	.14	.048	.128
37	Soya	(mil,Ji,i11	.095	115	.095	.112
38		Bojnurd	.247	.141	.232	.14
39		Ghomsheh	0	0	0	0
40	Fruit	Brujen	0	0	0	0
41	Pistachio	Damghan	.004	.02	.003	.(116
42	Citrus	Bam in	.75	0	.89	0
43	Date	Dashtcstan	0	0	0	0
44	Almond	Esfaricn	.062	.034	.027	.021
45	Pomegranate	Mehriz	1	0	1.33	0
46	Apricot	Damghan	.36	.18	.07	.051
4/	Apple	Firuzabad	.048	.122	.043	.118
48		Ghomsheh	0	0	0	0
4<>		Total	.024	.06	.021	.055
50	Rice	Lordegan	4	4	1.33	1.33
51		Gonabad	.017	007	.003	.004
52		Total	01	.006	.009	nor,
53	Beans	Brujerd	.118	.1	.121	.103
S4		Ghomsheh	0	0	0	0
55		Total	.035	.034	.035	.032
56	Alfalfa	Hamm	.25	.333	.244	.363
57		Ma layer	.248	.248	.214	.214
58		Total	.146	.16	.086	.109
59	Potato	Bandar Abas	.036	0	.036	0
00		Sarab	.013	.01	.012	.005
61		Total	.015	.16	.015	.109
62	Eggplant	BandarAbas	0	0	0	(1
63	Onion	Bandar Abbas	.003	.172	.003	.1
64	Tomato	Minab	.004	.01	.003	.004
65	Vegelable	Firuzabad	.01	.224	004	,06
66	Sugar Beet	Marvdashl	.166	.25	.04	.148
67		Salmas	.027	.027	.019	.019
68		Total	.043	.064	.013	.039

Table 8. AEP's social modeling efficiency coefficients

Table 8. AEP's social modeling efficiency coefficients

Row No.	Subject AEP	Place (Area)	1988 A	1988 B Fr	1988 B %	1988 C	1989 A	1989 B Fr	1989 B %	1989 C
i	Wheat	Brujen	15	3	m	1	15	3	20	1
2		ftojnurd	15	12	80	.86	15	•>	60	.86
3		Ardebil	13	12	'1.'	.»2	12	10	83	.83
4		Salmass	15	11	72	.85	16	12	75	B6
5		Dashtestan	16	16	to	1	u.	15	94	.94
		Malayer	13	6	40	.1'.	15	3	20	.80
7		Kurdkuy	15	4	27	.40	15	4	27	.■10
8		Total	31	(-1		.78	L04	56	54	.11
9	Barley	Bandar Abbas	15	10	67	.83	4	1	25	.50
10		Marvdasht	IS	10	(.7	.77	IS	"	60	.75
11		Sarab	15	1	60		13	8	(.2	.73
12		Kurdkuy	7	1	14	.33	6	1	17	.SO
13		Total	41	10	79	.73	38	l<)	Ml	.70
14	Rice	Lordegan	IS	1	7	1	15	1	7	1
15		Oonabad	16	13	81	.81	16	14	HH	.88
16		Total	31	M	45	.82	il	15	48	.88
17	lie.mi	Brujurd	15	t	67	.83	16	11	(-')	1
!K		Ghomsheh	16	10	63	1	16	10	(.3	1
19		Total	31	2()	-5	."1		•1	66	.<i|
20	Alfalfa	Bamm	16	1	a	,(>7	16	2	1.1	.67
21		Malayer	15	7	47	.54	IS	7	17	.VI
22		Total	31	11		.58	31	9	•<l	.56
23	Potato	Bandar Abbas	16	12	75	.86	4	4	100	1
24		Sarab	16	1-1	KH	.'13	14	13	93	.93
25		Total	32	26	81	.90	IK	17	94	,i|
26	Eggplant	Bandar Abbas	16	1(.	100	1	16	16	100	1
27	Onion	Bandar Abas	1(>	1	M	.97	II	7	50	.78
2ft	Tomato	Minab	16	M	88	.93	16	13	81	.93
29	Vegetable	Firuzabad	15	14	93	1	15	7	47	1
30	Sugar Beet	Marvdasbt	Hi	6	<.	1	11	3	27	.20
31		Sal mas	16	12	75	1	16	12	75	1
32		Total	26	18	69	1	27	15	56	.83
33	Cotton									
34										
3S		Total	32	26	81	.82	32	22	72	.82

Row No.	Subject AEP	Place (Area)	1988 A	1988 B Fr	1988 B %	1988 C	1989 A	1989 B Fr	1989 B %	1989 C
36	Sunflower	Bojnurd	15	9	60	.82	is	6	60	.75
37	Soya	Gonabad								
38		Kurdkuy								
39		Total	28	15	54	.71	31	16	52	.70
10		Bojnurd	15	6	■10	.55	k.	7	44	.64
41		Ghomsheh	15	1	7	1	15	1	7	1
42	Fruit	Brujen	15	1	7	1	16	1	6	1
43	Pistachio	Damghan	]'.	16	100	.94	If.	16	100	.86
44	Citrus	Bamm	16	1	6	,50	16	1	6	1
45	Date	Bush eh r	If-	16	100	1	16	16	100	1
46	Almond	Esfarien	K.	12	75	.80	16	12	(.1	.S3
47	Pomegranate	Mehriz	16	0	ii	0	IS	0	0	0
48	Apricot	Damghan	14	10	71	1	16	10	63	.83
49	Apple	Firuzabad	k.	11	69	.73	H.	9	!6	M
SO		(ihomsheh	16	6	3$	1	16		IK	1
51		Total	32	17	53	.81	32	15	17	.75
52	Grape	Firuzabad	16	1	6	.17	16	0	0	(I
53		Brujerd	16	1.1	81	1	16	13	HI	1
54		Total	32	14	■14	.74	32	11	41	.68
55	Cow	Fumann	11	10	91	.91	11	Id	91	.91
56		Salmass	U.	[2	75	.92	16	12	75	.92
57		Yazd	16	0	0	0	16	0	0	0
58		ToUl	43	22	51	.88	43	22	51	.92
59	Sheep	Esfarien	16	10	63	.71	l(.	10	63	.71
60		Mehriz	if.	4	25	.80	US	7	44	1
61		Damghan	K.	8	50	.80	ir.	7	11	.70
62		ToUl	48	22	46	.76	18	21	50	.77
63	Goat	Kohkiluye	15	14	93	.93	IS	14	93	.93
i.1	Honey	Dehdasht	IS	13	87	.87	15	12	S0	80
65	Dairy Sanitation	Marvdasht	IS	1-1	93	.93	15	13	87	,93
66		Esfarien	16	13	Rl	.93	U.	13	81	1
67		Salmass	15	10	1.7	1	15	11)	(.7	1
68		T..t..l	26	37	S0	M	1<>	M	78	.'17
69	Hay	Sarab	16	16	1(10	1	13	13	100	1
70		Turkman	16	11	K8	1	16	9	so	.90
71		Total	32	30	M	1	29	22	77	.97
72	Pasture	K.ilikikivc	[6	4	25	J0	16	4	25	.30
73		Lordegan	15	0	0	0	15	0	0	0
74		Total	31	4	13	M	31	4	13	JO
75		Grand/T	9.2	532	59	.83		878464	S3	.81

A: Number of interviewes

B: Number and percentage of target interviewes

C: Efficiency coefficient

modeling of extension projects, the above four criterion were considered as the basis for judgement. Primrily, research findings showed that, 95.6 percen of the rice producers needed training in biological controll. It was also concluded thai, "the less difference between the number of trained farmers and target group, the more efficient the extension projects". Moreover, there was statistically significant difference between those of target groups and none target groups in term of applying the extension boicontrol guidlines in rice production practice. The related extension projects were efficient (r=0.73) in term of their social modelin (i.e. serving the target group more than none target group).

AEP'S Efficiency Coefficient

According to Bennett [1], formal evaluation studies employ both qualitative and quantitative attribution. Qualitative attribution refers to whether the end users' adoption of specific practices and technologies (and the subsequent impacts of these adoptions) is due in some part to extension, research agencies, industry, and/or intermediated users. Qualitative attribution may also be based on conclusions drawn from many observations, studies and inferences.

Quantitative attribution refers to the extent to which the end users' adoption of specific technologies and practices, and consequent impacts, is attributable to activities by extension, research agencies, industry, and intermediate and/or end users.

In terms of qualitative evaluation of AEPs, the efficiency of each AEP was studied using the statistical model described so far in this article. Results from this stage of the study are presented in Table 8.

Data regarding each AEP efficiency shows that 36 AEPs out of 55 (66 percent) in 1988, and 34 out of 57 (60 percent) in 1989 were recognized as quite successful; 9 AEPs (16 percent) int 1988, and 12 (21 percent) in 1989 were successful, respectively. At the same time, four projects in each year of the study were found to have a low success rate, and finally only one project in 1988 and four projects in 1989 were unsuccessful in terms of meeting the target group clientele.

Furthermore, when the projects, from the most successful to the unsuccessful, were assigned scores from 5 to 1, projects conducted in 1988 received in total 250 scores, whereas the 1989 projects received 245. Comparing these efficiency values with those of 1986 and 1987 (208 and 202, respectively) showed considerable improvements. Again comparing the average efficiency values 4.36 in 1988 and 4.2 in 1989, with the efficiency value of 1987 (3.9) shows that not much improvement was recorded.

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بررسی کارآیی و مدل‌بندی اجتماعی طرحهای ترویجی کشاورزی با استفاده از توزیع دوجمله‌ایها

چکیده

بی‌شک افزایش کارآیی سرمایه‌گذاری‌های آموزشی از طریق فرآیند مدیریت صحیح، موضوعی است که مورد قبول همگان است. ترویج کشاورزی یکی از فعالیت‌های حساسی است که در توسعه جوامع کشاورزی، نیازمند سرمایه‌گذاری عقلایی قابل توجهی است. مدیریت طرحهای ترویج کشاورزی نیز به همین دلیل محتاج برنامه‌ریزی دقیق برای استفاه از این سرمایه‌گذاری است. بخصوص از جهت رویارویی با افراد هدف یا ارباب رجوع واقعی. این مقاله درباره یک روش آماری است که می‌تواند در طراحی مدل‌بندی اجتماعی برنامه‌های ترویج مورد استفاده قرار گیرد. این روش آماری که اصطلاحاً استفاده از توزیع دوجمله‌ایها در مدل‌بندی اجتماعی ترویج نامیده می‌شود، بوسیله نگارنده تهیه و به منظور مطالعه مدل‌بندیهای اجتماعی طرحهای ترویج کشاورزی و همچنین سنجش کارآیی این طرحها در دست‌یابی به ارباب‌رجوع واقعی مورد استفاده قرار گرفته است. این روش شامل چهار معیار است که عبارتند از: نیازهای آموزشی کشاورزان، شرکت آنها در برنامه‌های آموزشی، دست‌یابی آنها به امکانات برای نوپذیری و بالاخره، اجرای رهنمودهای ترویجی ارائه شده به آنها در برنامه‌های آموزشی ترویج. استفاده از این روشها و مصاحبه با ۹۱۲ نفر کشاورزانی که به طور تصادفی از بین کشاورزان مخاطب طرحهای ترویجی (۵۷ طرح ترویجی به تصادف انتخاب شد) برگزیده شده بودند، نشان داد که ۶۶ درصد از طرحهای مزبور در سال ۱۳۶۹ و ۶۰ درصد از آنها در سال ۱۳۷۰ در مدل‌بندی اجتماعی و دست‌یابی به افراد هدف کاملاً موفق بوده‌اند (در حد ۸۰ تا ۱۰۰ درصد) و ۱۶ درصد از طرحهای سال ۱۳۶۹ و ۱۲ درصد از طرحهای سال ۱۳۷۰ کارآ بودند (در حدود ۶۰ تا ۸۰ درصد). چهار طرح در هر یک از سال‌های مزبور کارآیی خیلی کمی داشتند (۴۰ تا ۶۰ درصد) و بالاخره یک طرح در سال ۱۳۶۸ و چهار طرح در سال ۱۳۷۰ کارآیی نداشته‌اند. با استفاده از این تجربه تحقیقی و روالی که در این مقاله توضیح داده شد به آسانی می‌توان از مدل مزبور برای تشخیص افراد هدف در میان کشاورزان استفاده کرد و از این طریق بهره‌وری طرح‌های آموزشی را به میزان قابل توجهی اضافه کرد. از این طریق است که می‌توان نسبت به ارزش افزوده طرحهای ترویجی یعنی آموزش سایر افراد بوسیله خود کشاورزان اطمینان یافت و حتی‌المقدور درکاهش هزینه‌های ترویجی نیز کوشید.

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