

Agricultural extension behaviour of local rural leaders in Duhok Governorate in Kurdistan region of Iraq

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Abstract:

This study investigated the socio-demographic and behavioral characteristics of local rural leaders in Duhok Governorate, Kurdistan Region of Iraq, and examined their relationship with leadership behavior in agricultural extension activities. A multi-stage random sampling technique was employed, selecting three districts and two sub-districts from each, resulting in a final sample of 420 farmers and 65 rural leaders. A structured questionnaire comprising 72 items was developed and refined through expert validation and item discrimination analysis, yielding a final version of 63 items with high reliability (Cronbach's Alpha = 0.8823). Data were analyzed using descriptive statistics (frequency, percentage, weighted mean, ranking) and inferential techniques (Chi-square test, coefficient of contingency). The results indicated that 78.461% of respondents leaders were middle-aged or older, 69.231% had secondary school or more, and 67.693% of them had medium to long-term leadership duration , (83.077%) were working in agriculture ,89.231% of the respondents were within the mid and high leadership situation, with generally positive attitudes toward modernization. Significant associations were identified between leadership behavior and age, education, leadership duration, occupation, leadership situation, and attitudes toward modernization. The findings underscore the critical influence of education, experience, and progressive attitudes in enhancing rural leadership and promoting agricultural development.

Keywords: Rural leaders; behavior; extension activities

1. Introduction:

The agricultural sector in developing countries represents a fundamental pillar of national economies, particularly given its role in providing essential raw materials for various high-value industries. However, many of these countries face a widening gap between the available agricultural equipment and the technological requirements necessary to meet production demands. This challenge is largely driven by rapid population growth and rising consumer demand, which have

compelled these nations to rely heavily on the importation of agricultural inputs and machinery [1]. Consequently, strengthening and modernizing the agricultural sector has become a matter of strategic importance. In the case of Iraq, this necessity is even more pressing, as the state bears a crucial responsibility in enhancing and upgrading agricultural practices. The sector's vitality, economic significance, and direct contribution to both individual welfare and the broader process of sustainable development underscore its urgent need for reform and investment [2].

Agricultural extension serves as a key factor in agricultural development, agribusiness growth, effective value-chain management, and food security, as the success of agricultural development is strongly connected to the guidance and support offered through extension services [3]. Through it, knowledge, scientific research results, recommendations and modern agricultural ideas are transferred in a simplified manner to farmers to improve their agricultural work and bring about desired behavioral changes [4].

Social psychologists emphasize the importance of leadership and the great role it plays in building different societies, as it occupies a major place in agricultural extension activities. Therefore, agricultural extension in developing countries must pay more attention to local leaders in discovering them, reaching them, getting to know them, raising their efficiency, and providing them with innovations. Appropriate agricultural methods, applying

them in their fields, and following them up with agricultural extension [5].

Rural leaders represent an important element for extension work and local community development. They represent one of the basic means of communication for information on agricultural knowledge. Local leaders are the link between modern sources of information and farmers, as they have the ability to influence the knowledge and behavior of other individuals. They are also distinguished by the ability to limit the agricultural problems facing farmers in the village and the ability to express them and participate in decision-making. They have a good relationship with agricultural extension and other development institutions and benefit from them in learning modern agricultural methods and achieving their ambitions to develop and advance agriculture [6].

Effective agricultural extension work focuses on communicating with farmers to persuade them to accept and adopt agricultural methods and innovations that represent appropriate solutions [7]. Due to the clear shortage in the numbers of agricultural extension workers in the Kurdistan Region and in Iraq in general, where agricultural extension workers suffer from a noticeable lack of workers, in addition to the lack of the inadequacy of the qualification and extension training that these extension workers obtain, which leads to difficulty in their familiarity with all the agricultural specializations required for the purpose of guiding farmers [8]. This situation necessitates relying on a number of local rural leaders in each village in order to work as a communication link between agricultural extension workers and farmers with the aim of Increasing the effectiveness of the agricultural extension system in carrying out its guidance message to the general public of farmers [9]

From the above, it becomes clear the great importance of the participation of local leaders in community development processes and in everything related to life in rural communities, foremost of which is participation in the

extension process, stimulating farmers, motivating them to work and moving them towards the goals set in the extension program. Their role in implementing extension work is also highlighted through their leadership influence on the behavior of farmers and attracting them to participate in extension activities.

The objectives of this study:

1. To determine the characteristics of local rural leaders in Duhok Governorate.
2. To discover the agricultural extension behavior of the local rural leaders.
3. To determine the correlation between the leadership behavior of local rural leaders in agricultural extension activities and the following variables: (age, education level, leadership duration, occupation, Urban openness, use of agricultural information sources, leadership situation, and attitudes toward modernization).

2. Methodology:

The geographical scope of this study was confined to the Duhok Governorate, where a multi-stage sampling technique was employed to select respondents. In the first stage, three districts were randomly selected, followed by the random selection of two sub-districts from each district.

The final sample consisted of 420 farmers and 65 rural local leaders. The primary research population comprised 195 local leaders aged 18 years and above, from which 65 were identified and selected using the sociometric method. The secondary research population included all farmers aged 18 years or older who were actively engaged in agricultural activities, from which 420 were randomly chosen as the study sample. 10% of the farmers from each village participated in identifying the extension behavior of the targeted rural leaders.

To achieve the research objectives, a structured questionnaire was designed and administered, consisting of two distinct sections tailored to specific dimensions of the inquiry. The first

section targeted the local rural leaders identified through the sociometric method and collected data on their personal and professional characteristics, such as age, educational level, leadership experience, occupation, Urban openness, sources of agricultural information, leadership context, and attitudes toward modernization. The second section was directed toward the followers of these leaders and focused on assessing the dependent variable—leadership behavior in relation to agricultural extension activities. In this section, a structured questionnaire consisting of 72 items was developed to collect data aligned with the study's objectives. To ensure clarity, relevance, and content validity, the instrument was reviewed by a panel of eight experts in the field. Based on their feedback, five items were removed and four were revised, resulting in a refined version containing 66 items. A subsequent discrimination index analysis was conducted to assess the ability of each item to distinguish among respondents. This analysis led to the removal of four additional items and the modification of sixteen others, yielding a final version of 63 items suitable for data collection. To confirm the reliability and internal consistency of the instrument, Cronbach's Alpha coefficient was computed, producing a value of 0.8823, which demonstrates a high degree of reliability.

For data analysis, both descriptive and inferential statistical methods were employed. Descriptive statistics, including frequency, percentage, weighted mean, and ranking, were used to summarize the data, while inferential techniques such as the Chi-square test and coefficient of contingency were applied to examine associations between categorical variables, providing a robust statistical framework for testing the study's hypotheses.

3. Results and discussion:

1. To determine the characteristics of local rural leaders in Duhok Governorate

The distribution of respondents across several socio-demographic and leadership-related characteristics is presented in table (1).

Table (1): Distribution of respondents according to their characteristics

No	Variables	Frequency	Percentage
1	Age		
	(34-47) young ages	14	21.538
	(48-61) middle ages	29	44.615
	(62-75) older ages	22	33.846
2	Educational level		
	Illiteracy	7	10.769
	Primary school	13	20.000
	Secondary school	28	43.077
	Institute	10	15.385
	College	7	10.769
3	Leadership duration		
	(1-7) years	21	32.308
	(8-27) years	36	55.385
	(28-34) years	8	12.308
4	Occupation		
	Agriculture	54	83.077
	Non- Agriculture	11	16.923
5	Urban openness		
	(15-18) low	5	7.692
	(19-25) medium	42	64.615
	(26-29) high	18	27.692
6	Agricultural information source		
	(10-14) low	10	15.385
	(15-23) medium	47	72.308
	(24-28) high	8	12.308
7	Leadership situation		
	(11-14) weak	7	10.769
	(15-23) medium	39	60.000
	(24-27) strong	19	29.231
8	Attitudes toward modernization		
	(21-24) negative	6	9.231
	(25-32) neutral	51	78.462
	(33-36) positive	8	12.308
	Total	65	100

The findings presented in table (1) highlight several important characteristics of the respondents. A considerable proportion of them (78.461%) were middle-aged or older, suggesting greater opportunities for agricultural extension programs to train and prepare these leaders to effectively fulfill their roles in various extension activities. In terms of education, the majority of respondents had attained secondary school or higher, which enhances their ability to address problems, update their knowledge, and adopt modern technologies in production, marketing, and rural life. Leadership duration was also notable, as 67.693% of respondents had medium to long-term leadership duration, indicating that extended practice in leadership roles contributes to accumulated knowledge, deeper understanding of responsibilities, and greater influence in convincing farmers to adopt environmentally sound agricultural practices, the majority of the respondents (83.077%) are working in agriculture. This could be an incentive for rural leaders to acquire agricultural knowledge and keep up

with new developments and modern agricultural technologies. Furthermore, the Urban openness of local leaders strengthens their position as pillars of communication and advisory sources for rural communities, enabling them to serve as role models during the adoption of innovations, particularly at the interest and evaluation stages. However, the results also revealed a decline in the knowledge and use of agricultural information sources, emphasizing the need for targeted extension programs to enhance leaders' awareness and capacity in this area. Regarding leadership situation, the majority of respondents (89.231%) fell within the mid and high categories, reflecting the role of leadership activities and personal traits in facilitating communication and providing extension guidance to rural people. Finally, attitudes toward modernization were predominantly neutral or positive (90.77%), which may reflect the strong sense of responsibility among rural leaders to engage with their communities and actively participate in rural development initiatives.

2. To discover the agricultural extension behavior of the local rural leaders

Table (2): Leadership behavior in agricultural extension activities

No	Categories	Frequency	Percentage
1	(72-105) low	69	16.43%
2	(106-155) medium	268	63.81%
3	(156-184) high	83	19.76%
Total		420	100%

This result indicates that the majority of rural leaders possess effective leadership qualities that are recognized by their followers. The relatively high percentage (63.81%) of leaders rated as having strong leadership behaviour shows that they are able to guide, motivate, and influence agricultural extension activities successfully. In addition, when combined with the percentage of leaders assessed as having an average level (19.76%), it becomes clear that more than four-fifths (83.57%) of the leaders demonstrate at least a satisfactory level of leadership behaviour. This suggests that rural

leaders play a positive role in supporting agricultural development, building trust among community members, and ensuring the success of extension programs, even though a small proportion (16.43%) still require improvement in their leadership practices.

When ranking the behavioral items of the rural leaders surveyed in the field of extension activities table (3), it was found that the items that occupied the top five positions were: (Has a friendly relationship with rural people, He gives others the responsibility to make important decisions about their own jobs, He

encourages the rural people to take the initiative among themselves, He allows rural people to decide the pace at which they carry out agricultural work, Farmers are given the autonomy to handle difficult situations according to their own judgment). This reflects the extent of the respondent's rural leaders

interest in participating in the affairs of their followers and their ability to influence the behavior of the community members and instill confidence in them and that they are also distinguished by their ability to identify and express the problems facing farmers in their area and participate in decision-making.

Table (3): The rank order of items of leadership behavior in agricultural extension activities

No	Items	weight mean	Rank
1	Has a friendly relationship with rural people	2.7238	1
2	He gives others the responsibility to make important decisions about their own jobs	2.5833	2
3	He encourages the rural people to take the initiative among themselves	2.48095	3
4	He allows rural people to decide the pace at which they carry out agricultural work	2.4429	4
5	Farmers are given the autonomy to handle difficult situations according to their own judgment	2.4404	5
6	He introduces and explains new methods in agricultural marketing to farmers	1.6833	59
7	He assists farmers in conducting demonstration experiments	1.5214	60
8	He pre-arranges for rural peoples the type of work and how it will be carried out	1.5143	61
9	He develops an agricultural work plan that helps rural people	1.5142	62
10	He clarifies the responsibilities and roles assigned to each member of the rural community	1.5071	63

As shown by the results of table (3) the last five items (He introduces and explains new methods in agricultural marketing to farmers, He assists farmers in conducting demonstration experiments, He pre-arranges for rural peoples the type of work and how it will be carried out, He develops an agricultural work plan that helps rural people, He clarifies the responsibilities and roles assigned to each member of the rural community). The results of all studies agree that the participation of rural leaders in agricultural extension is very important, as rural leaders play a prominent role in achieving agricultural extension goals and influencing farmers in the five stages of adopting modern innovations. Therefore, the

agricultural extension organization in the target area is requested to work to increase the participation of rural leaders in extension efforts, planning extension activities, and directing development activities in Duhok Governorate and the Kurdistan Region of Iraq in general.

3. To determine the correlation between the leadership behavior of local rural leaders in agricultural extension activities and the following variables: (age, education level, leadership duration, occupation, Urban openness, use of agricultural information sources, leadership situation, and attitudes toward modernization)

Table (4): Determine Correlation Between Variables

No	Independent variables	χ^2	rc
1	Age	7.7527	0.326*
2	Educational level	13.549	0.415**
3	Leadership duration	5.9599	0.290*
4	Occupation	6.5951	0.303*
5	Urban openness	2.4575	0.191
6	Agricultural information sources	2.6545	0.198
7	Leadership situation	10.219	0.368**
8	Attitudes toward modernization	6.3907	0.299*
Table(r) 5%=0.2542 , 1%=0.3301			

The results presented in table (4) reveal varying degrees of significance regarding the relationship between respondents' demographic and behavioral characteristics and their leadership behavior in agricultural extension activities. At the 5% level, the null hypothesis of no significant relationship between age and leadership behavior was rejected ($rc = 0.326^*$), indicating that age has a correlation, likely due to the accumulated awareness and experience of rural leaders in appreciating the importance of extension work and encouraging farmer participation. Similarly, a highly significant relationship was found between education level and leadership behavior at the 1% level ($rc = 0.415^{**}$), suggesting that more educated leaders possess greater capacity to understand, apply, and disseminate modern agricultural technologies and innovations. Leadership duration also showed a significant relationship ($rc = 0.290^*$), reflecting the role of accumulated experience in enhancing leaders' effectiveness and their engagement in extension activities. Moreover, occupation was significantly associated with leadership behavior ($rc = 0.303^*$), where leaders engaged in agricultural professions demonstrated greater openness to adopting and promoting new practices within their communities. In contrast, Urban openness showed no significant relationship ($rc = 0.191$), likely because the majority of respondents already belonged to medium and high Urban openness categories, minimizing variability. Likewise, no significant association was observed between the use of agricultural information sources and leadership

behavior ($rc = 0.198$), a result that may be attributed to the widespread reliance on such sources among most respondents. Conversely, leadership situation demonstrated a strong and significant relationship ($rc = 0.368^{**}$) at the 1% level, underscoring the role of a positive leadership environment in enhancing commitment, effectiveness, and goal attainment within extension programs. Finally, attitudes toward modernization exhibited a significant relationship ($rc = 0.299^*$), suggesting that leaders with positive orientations toward change are more likely to adopt and promote agricultural innovations, thereby acting as influential agents of transformation within rural communities.

4. Conclusions:

1. The majority of local rural leaders were middle-aged or older, with good experience to contribute effectively to agricultural extension activities.
2. Most leaders had attained at least secondary education, enhancing their innovation adoption capacity and problem-solving.
3. Leadership duration medium to long-term strengthened their influence and effectiveness in guiding farmers.
4. Agriculture was the primary occupation, reinforcing their openness to adopting and promoting modern practices.
5. Leadership traits emphasized cooperation, trust-building, and social cohesion, though individual problem-solving ranked lower.
6. Economic and social challenges in the region limited leaders' ability to address all

community needs.

Overall, local rural leaders hold strong potential as agents of agricultural development if adequately supported.

5. Recommendations:

1. Strengthen agricultural extension programs: Targeted training initiatives should focus on enhancing the technical and managerial capacities of rural leaders, particularly in the use of agricultural information sources and modern production technologies.

2. Promote education and continuous learning: Expanding educational opportunities and professional development programs for rural leaders will improve their ability to adopt innovations and provide effective guidance to farmers.

3. Encourage participatory leadership: Programs should emphasize participatory approaches that leverage leaders' ability to foster cooperation

and collective problem-solving within rural communities.

4. Address structural barriers: Policymakers should consider the financial and economic challenges faced by rural leaders and communities, ensuring that support mechanisms, subsidies, and resources are accessible to strengthen their leadership performance.

5. Enhance modernization attitudes: Awareness campaigns and extension activities should encourage positive attitudes toward modernization and innovation, positioning local rural leaders as role models in agricultural transformation.

6. Develop information networks: Building structured agricultural information-sharing platforms, such as digital extension services or farmer-leader networks, will improve leaders' access to updated knowledge and strengthen their advisory roles.

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