

# Leadership Effectiveness of Scientists in Indian Council of Agricultural Research<sup>†</sup>

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*The leadership effectiveness has long been held to be of consequence for achieving performance outcomes in research organizations. In this study, leadership effectiveness was examined among scientists in the ICAR institutions. Multinomial logistic regression analysis results indicated that there is evidence to suggest that respondent's designation, educational qualification, total experience and discipline group affect the leadership effectiveness. However, there is no evidence to suggest that respondent's, age, gender, number of days of technical training and management training affect the leadership effectiveness. It is suggested that specific behaviors included under task and relationship dimensions need to be advocated and practiced for leadership development. The results also indicated that these groups of researchers need to receive training in understanding leadership skills. Once they realize the need to have more flexibility in their leadership styles, they would be able to use the appropriate style depending on the situation. Further study is required to understand which combination of attitude and behavior is likely to be most effective in research organizations.*

## Introduction

Leadership can be defined as the ability to influence others toward the accomplishment of specific goals (Prentice, 1961). In business organizations, 'leadership' is often contrasted with 'management'. Management is typically defined as "getting things done through others." In comparison, leadership refers to "getting others to do things" (Robert, 1996). Thus, leadership is intimately tied up with motivating and influencing others.

In the emerging views of leadership, leaders are to be committed to "creating a world to which people want to belong." This commitment demands a special set of abilities for inspiring people to effectively and ecologically manifest the visions. It involves communicating, interacting, networking and managing relationships within an organization.

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Covey (1992) defined an influential theory of leadership which is based upon four dimensions: personal, interpersonal, managerial and organizational. The personal dimension is considered as the core dimension. Incidentally, it encompasses the value profile of the individual. Tannenbaum and Schmidt (1958) recommended that there are at least four internal forces that influence a manager's leadership style: value system, confidence in employees, personal inclinations and feelings of security in an uncertain situation.

Effective leadership actions facilitate followers' attainment of productivity, quality and satisfaction and it requires the right behavior, skill and attitude. The Ohio State University studies identified two major dimensions of leadership behavior, viz., initiating structure and consideration. Initiating structure is the degree to which the leader organizes and defines relationships in the group by activities such as assigning tasks and specifying procedures. Consideration is the degree to which the leader creates an environment of emotional support, warmth, friendliness and trust. The most effective leaders emphasize both initiating structure and consideration. The situation, however, often influences which leadership dimension should be emphasized. These two dimensions have also been described as leadership behaviors, which are production centered versus employee centered. It is a difference in the personality of the leaders to be either task-oriented or people-oriented.

Many task-related attitudes and behaviors of effective leaders have been identified. These are (1) adaptability to the situation; (2) direction setting; (3) high performance standards; (4) risk-taking and bias for action; (5) ability to interpret conditions; (6) frequent feedback; (7) stability of performance; and (8) strong customer orientation (DuBrin, 2002).

Many of the relationship-oriented attitudes and behaviors of the leaders include: (1) alignment of people; (2) mobilization; (3) concert building; (4) inspiration; (5) satisfaction of human needs; (6) making work meaningful for people; (7) emotional support and encouragement; and (8) promotion of principles and values (DuBrin, 2002).

Leadership effectiveness is often shown by expertise in initiating structure as well as showing consideration. Harari and Mukai (1990) developed an instrument to measure 'leadership effectiveness'.

Leadership in research organizations is the ability to give focus and vision to others, clearly identifying goals to which others also aspire, thus increasing productivity, efficiency and impact. It has to be practical, and it operates at many different levels within research organizations. Leadership at team level can be as important as leading many hundreds or thousands of people. In fact, the leadership of a large research organization such as National Agricultural Research System (NARS) cannot usually function well unless there are other leaders at a lower level who can implement the leader's vision by leading smaller groups of scientists towards common goals.

Robert (1996) suggested that effective leadership involves a mixture of different sets of leadership skills which include self-skills, relational skills, systemic thinking skills and strategic thinking skills.

**Self-skills:** Self-skills have to do with how the leader deploys himself or herself in a particular situation. They allow the leader to choose or engineer the most appropriate state, attitude, criteria, strategy, etc., with which to enter a situation. In a way, self-skills are the processes by which the leader leads himself or herself.

**Relational skills:** These skills have to do with the ability to understand, motivate and communicate with other people. They result in the ability to enter another person's model of the world or perceptual space and get them to recognize problems and objectives and understand the problem space within which they and the organization are operating.

**Systemic thinking skills:** The ability to think systemically in a practical and concrete way is probably the most definitive sign of maturity in a leader. These are used by the leader to identify and comprehend the problem space in which the leader, his or her collaborators and the organization is operating. Systemic thinking is at the root of effective problem-solving and the ability to create functional teams.

**Strategic thinking skills:** These are necessary in order to define and achieve specific goals and objectives. Strategic thinking involves the ability to identify a relevant desired state, assess the starting state and then establish and navigate the appropriate path of transitions states required to reach the desired state. A key element of effective strategic thinking is determining which operators and operations will most efficiently and effectively influence and move the present state in the direction of the desired state.

### Objectives of the Study

The objectives of the study are to investigate the leadership of research managers of the Indian Council of Agricultural Research (ICAR), and to measure their leadership effectiveness through self-assessment on basic leadership qualities. It is aimed to suggest measures for leadership effectiveness and to formulate recommendations for capacity building of scientific personnel to improve basic leadership qualities in agricultural research organizations.

### Methodology

The ICAR, a major constituent of NARS in India, was selected as the locale of the study. ICAR is catering to the needs of the State Agricultural Universities in the field of research and education and the farming community through the development and dissemination of technology and methodologies for improved production and productivity. The respondents were agricultural scientists located in 97 ICAR institutions and their regional stations in India.

### Research Design

The ex-post facto research design was used in the present study, as it deals with the events which have already happened, and the researcher does not have any control over the study variables. The inference about the relationships among independent and dependent variables are made without the direct involvement of the study due to continuous variation in the independent and dependent variables.

### Method of Sampling

The respondents were briefed about the study, its purpose and objectives by letter or by personal interaction of project team members as the case may be and were supplied with questionnaires. A total of 235 filled questionnaires were received from the respondents which have been used for the study.

### Selection and Measurement of Variables

In view of the objectives set for the study, dependent variable pertaining to leadership effectiveness was considered. As the leadership behavior is thought to be a learned behavior rather than inherited, factors which affect the learning process may also affect the leadership behavior. As a consequence, independent variables such as designation, age, gender, educational qualification, discipline group, total service experience, period of technical training undergone, period of management training undergone which are expected to have some bearing on the learning process were identified for inclusion in the study as factors which may affect the leadership effectiveness.

### Adoption and Standardization of Survey Questionnaire

The instrument developed by Harari and Mukai (1990) was adapted for Indian audience and was pre-tested with the participants of training programs at National Academy of Agricultural Research Management, a unit of ICAR. A majority of participants agreed with the results and interpretation when the instrument was tested establishing its validity and reliability in Indian conditions. The instrument tests the leadership effectiveness of the respondent as perceived by him or her.

### Statistical Analysis

The instrument, i.e., the questionnaire, was scored with the help of the key for it and the data so obtained for the dependent variable was coded, tabulated and analyzed using simple tabular analysis with frequencies and percentages using Microsoft Excel and SAS 9.2 software. Fisher's exact test was used for finding relationship between the independent variables like designation, age, gender, educational qualification, discipline group, total service experience, period of technical-training undergone, period of management training undergone and the dependent variable the leadership effectiveness score. As the response variable is of ordinal type with three categories—high effectiveness, medium effectiveness and low effectiveness—and the independent variables are also being converted into nominal (gender and discipline group) and ordinal (designation, age, educational qualification,

total experience, period of technical training and management training) type, the relationship between the dependent variable and independent variables is studied using multinomial logistic regression analysis using SAS 9.2 software.

## Results and Discussion

The study was done with 235 ICAR scientists. The information on the sample composition (Table 1) shows that out of 235 respondents, there were 16 respondents in Research Management Position (RMP), while 155 were senior level scientists and 64 were young scientists. The age categorization indicated that up to 40 years of age, there were 48 respondents, from 40-60 years of age, there were 54 respondents and beyond 60 years of age, there were 133 respondents. There were 213 male respondents and 22 female respondents. 175 respondents were having Ph.D. qualification, while 16 were having only M.Sc and 44 were not considered due to missing value. Qualification indicated that ICAR is staffed with highly qualified work force to pursue its research agenda. Among the different disciplines of agriculture, 31 belonged to commodity improvement, 88 belonged to commodity production, 31 from commodity protection, 9 from social sciences and 76 from basic sciences. In the case of job experience, 35 had up to 10 years of job experience, 40 had from 10-20 years of experience and 160 had more than 20 years

**Table 1: Total Number of Respondents in Different Classes of Each Category**

| Category                       | Classes (Numbers)          |                           |                               |                     |                       | Total |
|--------------------------------|----------------------------|---------------------------|-------------------------------|---------------------|-----------------------|-------|
| Position                       | RMP (16)                   |                           | Senior Level Scientists (155) |                     | Scientists (64)       | 235   |
| Age                            | Up to 40 years (48)        |                           | 40-60 years (54)              |                     | Beyond 60 years (133) | 235   |
| Gender                         | Male (213)                 |                           | Female (22)                   |                     | -                     | 235   |
| Educational Qualification      | M.Sc. (16)                 |                           | Ph.D. (175)                   |                     | Missing Value (44)    | 235   |
| Discipline                     | Commodity improvement (31) | Commodity production (88) | Commodity protection (31)     | Social sciences (9) | Basic sciences (76)   | 235   |
| Experience                     | Up to 10 years (35)        |                           | 10-20 years (40)              |                     | Above 20 years (160)  | 235   |
| Technical Training Experience  | Up to 30 days (135)        | 30-90 days (35)           | 90-180 days (27)              |                     | 180-365 days (38)     | 235   |
| Management Training Experience | Up to 30 days (162)        | 30-90 days (25)           | 90-180 days (26)              |                     | 180-365 days (22)     | 235   |

of job experience. 135 people had attended technical training programs up to 30 days of period, 35 people had attended technical training programs of 30-90 days duration, 27 people attended technical training programs of 90-180 days duration and 38 people had attended technical training programs of more than 180 days duration. Similarly, 162 people had attended management training programs up to 30 days, 25 people had attended management training programs of 30-90 days duration, 26 people attended management training programs of 90-180 days duration and 22 people had attended management training programs of more than 180 days duration.

## Relationship Between Leadership Effectiveness and Designation of the Scientist

It was observed from Table 2 that among the different designation levels, purely on the percentage count, high leadership effectiveness was more at RMP (25%) than young scientist (14.06%) level and senior level scientist level (10.32%). However, more research is required to draw any conclusions since these differences were not significant due to the fact that there were only 16 RMPs in comparison to 155 senior level scientists and 64 young scientists. Similarly, relatively more percentages were found in moderate effectiveness level at RMP (62.50%) than senior scientist (58.71%) and young scientist (46.88%). At the end, low effectiveness was more at young scientist (39.06%) than senior level scientist (30.97%) and RMP (12.50%). Thus a majority of scientists at research management position showed high leadership effectiveness and moderate effectiveness, indicating that as scientists move up the managerial ladder, they improve their leadership skills. However, as the total numbers of RMPs in this sample are only 16, further research is needed with higher number of RMP respondents to confirm this.

**Table 2: Designation × Effectiveness Cross Tabulation (Frequency)**

| Designation            | Effectiveness |               |               |            |
|------------------------|---------------|---------------|---------------|------------|
|                        | High          | Moderate      | Low           | Total      |
| RMP                    | 4<br>(25.00)* | 10<br>(62.50) | 2<br>(12.50)  | 16         |
| Senior Level Scientist | 16<br>(10.32) | 91<br>(58.71) | 48<br>(30.97) | 155        |
| Young Scientist        | 9<br>(14.06)  | 30<br>(46.88) | 25<br>(39.06) | 64         |
| <b>Total</b>           | <b>29</b>     | <b>131</b>    | <b>75</b>     | <b>235</b> |

Note: \* Figures in parenthesis are row percentages in all the frequency tables (Tables 2-9).

## Effect of Age on Leadership Effectiveness

It is observed from Table 3 that relatively more percentage of people of age group up to 60 years (16.67%) are found to be high effective than leaders of above 60 years

**Table 3: Age Group × Effectiveness Cross Tabulation (Frequency)**

| Age (Years)  | Effectiveness |               |               |            |
|--------------|---------------|---------------|---------------|------------|
|              | High          | Moderate      | Low           | Total      |
| ≤40          | 5<br>(10.42)  | 22<br>(45.83) | 21<br>(43.75) | 48         |
| 40-60        | 9<br>(16.67)  | 26<br>(48.15) | 19<br>(35.19) | 54         |
| >60          | 15<br>(11.28) | 83<br>(62.41) | 35<br>(26.32) | 133        |
| <b>Total</b> | <b>29</b>     | <b>131</b>    | <b>75</b>     | <b>235</b> |

(11.28%) of age. However, more percentage of researchers in above 60 years age were found in moderate effective (62.41%) level than up to 60 (48.15%) and lower age groups (45.83%). Low effectiveness is observed more in the case of lower aged group of up to 40 years (43.75%), which is followed by up to 60 years (35.19%) and above 60 years (26.32%) people. This indicates as researchers' age increases, they gain effectiveness, which may, however, taper off as one crosses the age of 60 years.

#### Leadership Effectiveness and Gender

It was observed from Table 4 that in high effective group, the percentage of male researchers was (12.68%) more than the female (9.09%). However, relatively more percentage of female researchers (63.64%) were found in moderately effective group than males (54.93%). In low effective group, the male researcher's percentage (32.39%) was more than the female (27.27%). Gary (2010) cautioned in his book, *Leadership in Organizations*, that research on differences in gender and leadership effectiveness has been questionable. For this reason, he contends that gender is not a good predictor of leadership effectiveness and does not impact employees or the workplace. However, more research is required to draw any conclusions since the females in the workplace are very few with the present sample having 213 males versus 22 females.

**Table 4: Gender × Effectiveness Cross Tabulation (Frequency)**

| Gender       | Effectiveness |                |               |            |
|--------------|---------------|----------------|---------------|------------|
|              | High          | Moderate       | Low           | Total      |
| Male         | 27<br>(12.68) | 117<br>(54.93) | 69<br>(32.39) | 213        |
| Female       | 2<br>(9.09)   | 14<br>(63.64)  | 6<br>(27.27)  | 22         |
| <b>Total</b> | <b>29</b>     | <b>131</b>     | <b>75</b>     | <b>235</b> |

#### Effect of Educational Qualification on Leadership Effectiveness

It is observed from Table 5 that all the respondents in high effectiveness group had Ph.D. qualification (13.14%). In moderate effective level group also, the respondents with Ph.D.

**Table 5: Educational Qualification × Effectiveness Cross Tabulation (Frequency)**

| Educational Qualification | Effective     |                |               |             |
|---------------------------|---------------|----------------|---------------|-------------|
|                           | High          | Moderate       | Low           | Total       |
| M.Sc.                     | 0<br>(0.00)   | 6<br>(37.50)   | 10<br>(62.50) | 16          |
| Ph.D.                     | 23<br>(13.14) | 105<br>(60.00) | 47<br>(26.86) | 175         |
| <b>Total</b>              | <b>23</b>     | <b>111</b>     | <b>57</b>     | <b>191*</b> |

**Note:** \* The total number is 191, out of (235), as 44 respondents did not mention their educational qualification.

(60%) were more than with M.Sc. (37.50%). However, in low effective level, more researchers are with M.Sc. (62.50%). The increased leadership effectiveness of respondents with higher qualifications might be due to the maturity level and exposure of the respondents while pursuing higher studies and also the interactions they had with experienced and senior researchers. However, more research is required to draw any conclusions since the total number of respondents with M.Sc. was very less at 16 in comparison to 175 respondents with Ph.D.

#### Leadership Effectiveness Across Different Disciplines of Agricultural Research

Among the different disciplines, high percentage of effectiveness was observed in respondents of commodity production discipline (17.05%) than in basic sciences (11.84%), social sciences (11.11%), commodity improvement (6.45%) and commodity protection (6.45%) (Table 6). In the moderate effectiveness category, it was observed that

**Table 6: Discipline × Effectiveness Cross Tabulation (Frequency)**

| Discipline            | Effectiveness |               |               |            |
|-----------------------|---------------|---------------|---------------|------------|
|                       | High          | Moderate      | Low           | Total      |
| Commodity Improvement | 2<br>(6.45)   | 24<br>(77.42) | 5<br>(16.13)  | 31         |
| Commodity Production  | 15<br>(17.05) | 43<br>(48.86) | 30<br>(34.09) | 88         |
| Commodity Protection  | 2<br>(6.45)   | 16<br>(51.61) | 13<br>(41.94) | 31         |
| Social Sciences       | 1<br>(11.11)  | 4<br>(44.44)  | 4<br>(44.44)  | 9          |
| Basic Sciences        | 9<br>(11.84)  | 44<br>(57.89) | 23<br>(30.26) | 76         |
| <b>Total</b>          | <b>29</b>     | <b>131</b>    | <b>75</b>     | <b>235</b> |

higher percentage researchers of commodity improvement (77.42%) than in basic sciences (57.89%), commodity protection (51.61%), commodity production (48.86%) and social sciences (44.44%). More percentage of researchers of social sciences (44.44%) were found in low effective group than in commodity protection (41.94%), commodity production (34.09%), basic sciences (30.26%) and commodity improvement (16.13%). Further study is required with more respondents from social sciences, commodity improvement and commodity protection to confirm any kind of trend.

#### Length of Work Experience and Leadership Effectiveness

It is seen in Table 7 that relatively more percentage of (17.50%) respondents with 10-20 years of experience were found in high effective group than respondents with up to 10 years (11.43%) and with more than 20 years (11.25%) of experience. However, relatively more percentage of researchers were found in moderate effective level at higher experience group of 20 years (60.00%) than in up to 10 years of experience (51.43%) and 10-20 years of experience group (42.50%). In low effective group, more percentage of researchers were with 10-20 years (40%) of experience followed by up to 10 (37.14%) and more than 20 years (28.75%). This might be due to the reason that in early years of service, the respondents have less confidence in themselves. As they gain more experience in research, they become more effective in leadership. However, with higher experience, some may also decline in their effectiveness.

| Experience (Years) | Effectiveness |               |               |       |
|--------------------|---------------|---------------|---------------|-------|
|                    | High          | Moderate      | Low           | Total |
| ≤10                | 4<br>(11.43)  | 18<br>(51.43) | 13<br>(37.14) | 35    |
| 10-20              | 7<br>(17.50)  | 17<br>(42.50) | 16<br>(40.00) | 40    |
| >20                | 18<br>(11.25) | 96<br>(60.00) | 46<br>(28.75) | 160   |
| Total              | 29            | 131           | 75            | 235   |

#### Duration of Technical Training and Leadership Effectiveness

It was evident from Table 8 that more percentage of respondents with 30-90 days technical training period was in high effectiveness group (22.86%) than with more than 180 days (13.16%), up to 30 days (10.37%) and 90-180 days (7.41%). A major percentage of researchers was found moderately effective irrespective of the duration of technical training they received, followed by their presence in low effective group. Technical training can help the researchers to become moderately effective but to be highly effective, they may have to develop specific personality traits, such as proactive, risk-taking ability, innovative thinking, etc.

| Technical Training (Days) | Effectiveness |               |               |       |
|---------------------------|---------------|---------------|---------------|-------|
|                           | High          | Moderate      | Low           | Total |
| ≤30                       | 14<br>(10.37) | 76<br>(56.30) | 45<br>(33.33) | 135   |
| 30-90                     | 8<br>(22.86)  | 19<br>(54.29) | 8<br>(22.86)  | 35    |
| 90-180                    | 2<br>(7.41)   | 14<br>(51.85) | 11<br>(40.74) | 27    |
| >180                      | 5<br>(13.16)  | 22<br>(57.89) | 11<br>(28.95) | 38    |
| Total                     | 29            | 131           | 75            | 235   |

#### Duration of Management Training and Leadership Effectiveness

It was observed from Table 9 that more percentage of respondents in high effectiveness group had 90-180 days (19.23%) management training period than with 30-90 days (16.00%), up to 30 days (11.11%) and more than 180 days (9.09%). Number of days of management training had much impact in high effective group than in moderate and low effective groups. Management training must help the researchers to be highly effective in their leadership. A majority of respondents were found moderately effective irrespective of the duration of management training they received. It indicated that much emphasis is needed to develop leadership skills among the researchers.

| Management Training (Days) | Effectiveness |               |               |       |
|----------------------------|---------------|---------------|---------------|-------|
|                            | High          | Moderate      | Low           | Total |
| ≤30                        | 18<br>(11.11) | 87<br>(53.70) | 57<br>(35.19) | 162   |
| 30-90                      | 4<br>(16.00)  | 18<br>(72.00) | 3<br>(12.00)  | 25    |
| 90-180                     | 5<br>(19.23)  | 14<br>(53.85) | 7<br>(26.92)  | 26    |
| >180                       | 2<br>(9.09)   | 12<br>(54.55) | 8<br>(36.36)  | 22    |
| Total                      | 29            | 131           | 75            | 235   |

It is thus seen in the leadership study, only 29 (12.34%) respondents have scored high effectiveness, whereas 131 (55.74%) have scored moderate effectiveness and 75 (31.91%) low effectiveness. Chi-square test was found to be not valid because in all the two-way

frequency tables, more than 50% of the cells have an expected frequency of less than 5. Therefore, Fisher's exact test was used. Educational qualification of the researcher was found to be associated with leadership effectiveness at 5% level of significance (Table 10).

| Variable: Association with Leadership Effectiveness | Pr. $\leq P$ |
|---|--------------|
| Designation   | 0.1168       |
| Age   | 0.1283       |
| Gender  | 0.8096       |
| Educational Qualification                           | 0.0145       |
| Discipline Group                                    | 0.1969       |
| Total Experience                                    | 0.3077       |
| Technical Training                                  | 0.4765       |
| Management Training                                 | 0.2630       |

Multinomial Logistic Regression Analysis of the Maximum likelihood estimates of the parameters indicates that there is evidence that designation, educational qualification and total experience affect leadership effectiveness at 5% level of significance, while discipline affects at 10% level of significance (Table 11).

| Parameter                 |                        | df | Estimate | Standard Error | Wald Chi-Square | Pr. > Chi. Sq. |
|---------------------------|------------------------|----|----------|----------------|-----------------|----------------|
| Intercept                 | 1                      | 1  | -3.1532  | 1.0645         | 8.7740          | 0.0031         |
| Intercept                 | 2                      | 1  | 0.0542   | 1.0339         | 0.0028          | 0.9582         |
| Designation               | RMP                    | 1  | 2.0699   | 0.8952         | 5.3461          | 0.0208         |
| Designation               | Senior Level Scientist | 1  | 1.4807   | 0.6716         | 4.8611          | 0.0275         |
| Age                       | <40 years              | 1  | -0.5425  | 1.0766         | 0.2539          | 0.6143         |
| Age                       | 40-60 years            | 1  | 0.0379   | 0.5453         | 0.0048          | 0.9446         |
| Gender                    | Male                   | 1  | -0.4400  | 0.5633         | 0.6100          | 0.4348         |
| Educational Qualification | M.Sc.                  | 1  | -1.6660  | 0.5890         | 8.0014          | 0.0047         |
| Discipline Group          | Commodity Improvement  | 1  | 0.2610   | 0.5252         | 0.2469          | 0.6193         |
| Discipline Group          | Commodity Production   | 1  | -0.5089  | 0.3805         | 1.7891          | 0.1810         |

Table 11 (Cont.)

| Parameter           |                      | df | Estimate | Standard Error | Wald Chi-Square | Pr. > Chi. Sq. |
|---------------------|----------------------|----|----------|----------------|-----------------|----------------|
| Discipline Group    | Commodity Protection | 1  | -0.8885  | 0.5004         | 3.1530          | 0.0758         |
| Discipline Group    | Social Sciences      | 1  | -0.4208  | 0.7817         | 0.2898          | 0.5903         |
| Total Experience    | $\leq 10$ years      | 1  | 1.7343   | 1.0684         | 2.6349          | 0.1045         |
| Total Experience    | 10-20 years          | 1  | 1.5010   | 0.7266         | 4.2671          | 0.0389         |
| Technical Training  | $\leq 30$ days       | 1  | -0.1338  | 0.4113         | 0.1058          | 0.7450         |
| Technical Training  | 30-90 days           | 1  | 0.4676   | 0.5011         | 0.8708          | 0.3507         |
| Technical Training  | 90-180 days          | 1  | -0.8176  | 0.5482         | 2.2242          | 0.1359         |
| Management Training | $\leq 30$ days       | 1  | 0.2311   | 0.5011         | 0.2126          | 0.6447         |
| Management Training | 30-90 days           | 1  | 0.9391   | 0.6271         | 2.2424          | 0.1343         |
| Management Training | 90-180 days          | 1  | 0.7839   | 0.6207         | 1.5952          | 0.2066         |

Also, 95% Wald confidence interval for the odds ratios was computed and significant odds ratio value of 7.924 for RMP versus young scientist and 4.396 for senior level scientist versus young scientist indicates that RMP and senior level scientists are expected to have higher effectiveness than that of the young scientists in ICAR (Table 12). Further, significant odds ratio 0.189 for educational qualification M.Sc. versus Ph.D. indicates that respondents having Ph.D. degree (or higher education) is expected to have higher effectiveness than that of the respondents having post-graduation (M.Sc.) educational qualification. Odds ratio value of 4.486 for total experience of 10-20 years versus >20 years' experience indicates that those with total experience of 10-20 years have high leadership effectiveness than respondents having more (i.e., >20 years) experience. It is also seen that odds ratio 3.615 for respondents having technical training of 30-90 days versus 90-180 days indicates that respondents with 30-90 days experience of technical training are more likely to have high effectiveness than those with 90-180 days experience of technical training.

Apart from the questionnaire, interview method was also used to supplement the study. During personal discussion with participants, it was observed that their leadership style depended upon situation. Leaders are known to exhibit different leadership styles ranging



| Label  | Estimate | 95% Confidence Limits |        |
|--|----------|-----------------------|--------|
|  |          |                       |        |
| Designation RMP versus Senior Level Scientist                      | 1.803    | 0.578                 | 5.625  |
| Designation RMP versus Young Scientist                             | 7.924    | 1.371                 | 45.813 |
| Designation Senior Level Scientist versus Young Scientist          | 4.396    | 1.179                 | 16.394 |
| Age <40 years versus 40-60 years                                   | 0.560    | 0.097                 | 3.237  |
| Age <40 years versus >60 years                                     | 0.581    | 0.070                 | 4.795  |
| Age 40-60 years versus >60 years                                   | 1.039    | 0.357                 | 3.024  |
| Gender Male versus Female  | 0.644    | 0.213                 | 1.943  |
| Educational qualification M.Sc. versus Ph.D.                       | 0.189    | 0.060                 | 0.600  |
| Discipline Group Commodity Improvement versus Commodity Production | 2.160    | 0.789                 | 5.913  |
| Discipline Group Commodity Improvement versus Commodity Protection | 3.157    | 0.963                 | 10.342 |
| Discipline Group Commodity Improvement versus Social Sciences      | 1.977    | 0.369                 | 10.583 |
| Discipline Group Commodity Improvement versus Basic Sciences       | 1.298    | 0.464                 | 3.634  |
| Discipline Group Commodity Production versus Commodity Protection  | 1.462    | 0.567                 | 3.768  |
| Discipline Group Commodity Production versus Social Sciences       | 0.916    | 0.198                 | 4.237  |
| Discipline Group Commodity Production versus Basic Sciences        | 0.601    | 0.285                 | 1.267  |
| Discipline Group Commodity Protection versus Social Sciences       | 0.626    | 0.121                 | 3.236  |
| Discipline Group Commodity Protection versus Basic Sciences        | 0.411    | 0.154                 | 1.097  |
| Discipline Group Social Sciences versus Basic Sciences             | 0.657    | 0.142                 | 3.038  |
| Total Experience ≤10 years versus 10-20 years                      | 1.263    | 0.240                 | 6.650  |
| Total Experience ≤10 years versus >20 years                        | 5.665    | 0.698                 | 45.984 |
| Total Experience 10-20 years versus >20 years                      | 4.486    | 1.080                 | 18.636 |
| Technical Training ≤30 days versus 30-90 days                      | 0.548    | 0.235                 | 1.276  |
| Technical Training ≤30 days versus 90-180 days                     | 1.981    | 0.773                 | 5.076  |
| Technical Training ≤30 days versus >180 days                       | 0.875    | 0.391                 | 1.959  |

Table 12 (Cont.)

| Label   | Estimate | 95% Confidence Limits |        |
|---|----------|-----------------------|--------|
|   |          |                       |        |
| Technical Training 30-90 days versus 90-180 days  | 3.615    | 1.184                 | 11.039 |
| Technical Training 30-90 days versus >180 days    | 1.596    | 0.598                 | 4.262  |
| Technical Training 90-180 days versus >180 days   | 0.442    | 0.151                 | 1.293  |
| Management Training ≤30 days versus 30-90 days    | 0.493    | 0.196                 | 1.237  |
| Management Training ≤30 days versus 90-180 days   | 0.575    | 0.223                 | 1.482  |
| Management Training ≤30 days versus >180 days     | 1.260    | 0.472                 | 3.364  |
| Management Training 30-90 days versus 90-180 days | 1.168    | 0.346                 | 3.937  |
| Management Training 30-90 days versus >180 days   | 2.558    | 0.748                 | 8.743  |
| Management Training 90-180 days versus >180 days  | 2.190    | 0.649                 | 7.392  |

from a stage where full control is permitted to the followers to a stage where the leader retains all the control with him or her. A cursory glance of their situational leadership style (Hersey and Blanchard, 1977) indicated that a majority of them were not adept at their situational leadership style and this might be affecting their leadership effectiveness.

### Conclusion

Understanding effective leadership behaviors and attitudes has its limitations. However, the framework of the task-related versus relationship related classification helps in unraveling the effectiveness of leadership. Both these qualities can be studied to assess leaders on their effectiveness. The specific behaviors included under task and relationship dimensions need to be kept in mind to improve leadership practice. For a leader to be effective in a given situation, it would be required to find the right mix of behaviors and attitudes from the task-relationship cafeteria. Logistic regression analysis results indicated that there is evidence to suggest that respondent's designation, educational qualification, total experience and discipline group affect the leadership effectiveness. However, there is no evidence to suggest that respondent's, age, gender, number of days of technical training and management training affect the leadership effectiveness. However, Harari and Mukai (1990) studied that if it is not experience/education that makes the real difference in effective managerial performance, then what does? They have opined that the accuracy of leader's understanding of their managerial role might be making the difference. The following formula illustrates their finding:

$$\text{Performance} = \text{Ability} \times \text{Motivation} \times \text{Accuracy of Role Perception}$$

The results of leadership effectiveness lead us to the conclusion that this group of researchers needs to receive training in terms of leadership skills. Once they develop the needed skill to have more flexibility in applying different leadership styles, they would

be able to use the appropriate style depending on the situation, organizational climate, nature of task, etc.

**Suggestions for Improvement:** Thus from the above, it is found that among the agricultural researchers of ICAR, the leadership effectiveness is not high, and it is suggested that in order to improve this leadership effectiveness, certain initiatives may be planned in ICAR. These initiatives are to be in the shape of planned, management development programs. The research managers could be advised for mentoring the potential young scientists to provide second line of leadership to the organization who would be able to deal with situations effectively in future. There is a need to groom a second line of leadership coupled with responsibility, accountability and autonomy to imbibe leadership and to develop effective leadership character during the early career of young scientists. These in turn would result in effective leadership, which will positively influence the organizational effectiveness. □

### References

1. Covey S R (1992), "Principle Centered Leadership", Simon and Schuster UK Ltd.
2. DuBrin A J (2002), *Leadership: Research Findings, Practice, and Skills*, Second Edition, p. 442, Houghton Mifflin Company, Boston.
3. Gary A Y (2010), *Leadership in Organizations*, 7<sup>th</sup> Edition, p. 644, Upper Saddle River, Pearson, NJ, London.
4. Harari O and Mukai L (1990), "A New Decade Demands a New Breed of Manager", *Management Review*, Vol. 79, No. 8, pp. 20-24.
5. Hersey P and Blanchard K H (1977), *The Management of Organizational Behaviour*, 3<sup>rd</sup> Edition, p. 360, Upper Saddle River, Prentice Hall, NJ.
6. Joshi P K, Manikandan P and Paroda R S (2010), Summary Proceedings and Recommendations of National Dialogue on "Building Leadership in Agricultural Research Management – Concerns and Future Strategy", August 27-28, p. 24, NAARM, Hyderabad.
7. Prentice W C H (1961), "Understanding Leadership", *Harvard Business Review*, Vol. 39, No. 5, p. 143.
8. Robert Dilts (1996), "The New Leadership Paradigm", available at <http://www.nipu.com/Articles/article8.htm>
9. SAS Institute Inc. (2009), "Statistics I: Introduction to ANOVA, Regression and Logistic Regression Course Notes", Cary, NC: SAS Institute Inc.
10. Tannenbaun R and Schmidt W (1958), "How to Choose a Leadership Pattern", *Harvard Business Review*, March-April, pp. 95-102.

## Appendix

| Questionnaire   |   |                                   |   |
|---|---|-----------------------------------|---|
| How Effective Are You as a Leader?  |   |                                   |   |
| Directions: Circle the number on the 1-5 scale that best indicates how you really feel. If you are not now in a management position, project how you would react if you were in one. The numbers do not indicate highest or lowest. The number nearer to the statement indicates your strength of preference. |   |                                   |   |
| S. No.  | Statements  | Circle the Preferred Number Below | Statements  |
| 1.  | I'll wait until things settle down.                                       | 1 2 3 4 5                         | I really like change.   |
| 2.  | Most of my staff meetings are about internal procedures and budgeting.    | 1 2 3 4 5                         | I spend much of my time talking to and about clients.                     |
| 3.  | If there's a way, I'll find it.   | 1 2 3 4 5                         | Top management should make the first move.                                |
| 4.  | I'll wait for orders from above.  | 1 2 3 4 5                         | Let's get it done right now.  |
| 5.  | I seek responsibility beyond my job description.                          | 1 2 3 4 5                         | I fulfil my job description.  |
| 6.  | How can I enhance revenue? Add value?                                     | 1 2 3 4 5                         | I'll stay within my budget plan.  |
| 7.  | My people should "challenge the system".                                  | 1 2 3 4 5                         | I carefully review subordinates' work.                                    |
| 8.  | If I haven't been told yes, I can't do it.                                | 1 2 3 4 5                         | If I haven't been told <i>no</i> , I can do it.                           |
| 9.  | I'll take responsibility for my failures.                                 | 1 2 3 4 5                         | I usually make excuses for my failures.                                   |
| 10.   | I won't take risks because I may fail.                                    | 1 2 3 4 5                         | I'll take risks although I may fail.                                      |
| 11.   | We've got to do things faster.  | 1 2 3 4 5                         | We can't turn things around that fast.                                    |
| 12.   | I want to know what other departments are doing and what their needs are? | 1 2 3 4 5                         | I protect my own department.  |
| 13.   | I talk mainly to those people who are formally linked to me.              | 1 2 3 4 5                         | I'll go beyond the organization chart to share information and resources. |
| 14.   | Leave my people and me alone and let us get our job done.                 | 1 2 3 4 5                         | I'll cross department lines to get the job done.                          |



Appendix (Cont.)

| S. No.   | Statements   | Circle the Preferred Number Below | Statements   |
|--|--|-----------------------------------|--|
| 15.  | I trust only a few people within the organization. | 1 2 3 4 5                         | I volunteer to share ideas and resources with people in other departments. |
| <p><b>Scoring and interpretation:</b> Measure your effectiveness as a managerial leader as follows: For questions 1, 2, 4, 8, 10, 13, 14, and 15, simply add up the scores. For questions 3, 5, 6, 7, 9, 11 and 12, flip the scale so that a response score of 1 becomes 5, 2 becomes 4, 4 becomes 2, and 5 becomes 1. A total score of 60 means you have the mindset of an effective manager. If you scored below 45, you have some work to do.</p> |  |                                   |  |

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