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# Assessment of effectiveness of extension methods for dissemination of soil and water conservation technologies

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### ABSTRACT

Study was initiated during 2004 with the objective to find out effective extension methods for dissemination of Soil and Water Conservation (SWC) technologies for watershed development. Frequency use and effectiveness indices along with structured schedules were developed to assess and evaluate different extension methods. The study revealed that majority of farmers were using radio and television more frequently for information on different agricultural and SWC technologies. The less frequently used extension methods by the farmers were bulletin & documentary film show, exhibition, study tour, result demonstration and method demonstration. It was also found that the most effective extension methods as perceived by farmers for dissemination of SWC technologies were farm & home visit in individual contact, discussion meeting & result demonstration in group contact and film show in mass contact. Whereas, according to officers of watershed development team and extension scientists the highly effective extension methods were farm & home visit in individual contact methods, result demonstration, study tour, lecture and discussion meeting in group contact methods and they considered none of extension method highly effective in mass contact methods. The study concludes that most effective extension methods as perceived by both, the farmers and officers were, farm and home visit in individual contact, result demonstration in group contact and bulletin as well as documentary film show in mass contact methods, for effective dissemination of SWC technologies for watershed management.

### 1. INTRODUCTION

Swaminathan (1998) said rainfed agriculture to be productive, should be based on a watershed as the unit of development. Watershed is not technology but a concept, which integrates conservation, management and budgeting of rainwater through simple but discrete hydrological units. Simultaneously, a watershed supports a holistic framework which means a combined application of technologies on soil and water conservation with improved crop varieties, farming systems and agronomic management, taking into account both arable and non-farm land.

The specific objectives of the watershed programme include promotion of soil and water conservation, optimal use of land and water resources (Singh, 1993). Therefore, the Soil and Water Conservation (SWC) technologies

developed for sustainable development of watershed catchment area were considered as watershed technologies in this study.

Extension methods play a vital role in transfer of innovations from research farm to farmer's fields. Selection of extension method should be according to farmers' knowledge, understanding and their conditions. Extension methods help farmers to understand, accept and adopt the technologies easily. Soil and water conservation technologies should be provided to the farmers in simpler and easy form with the help of different extension methods or combination of methods so that farmers can understand and adopt SWC technologies easily. This study would help to identify the effective extension methods for dissemination of soil and water conservation technologies.

With this aim, the main objective was framed to investigate the effectiveness of individual, group and mass contact methods for dissemination of soil and water conservation technologies for watershed development. The research project initiated in 2004 has made an effort to suggest an appropriate extension methodology for effective transfer of soil and water conservation technologies to farmers on watershed approach, since effectiveness of a method depends upon selecting the right method, at right time (Kerkhof, 1990).

**2. MATERIALS AND METHODS**

The study was conducted during 2004-2006 in the purposively selected well developed watersheds of Gujarat state. The farmer respondents were selected randomly from the selected watersheds and the staff respondents from the watershed development departments. A schedule was developed and pre-testing of schedule was done. The responses of the respondents were recorded in the schedule with the help of personal interview method. The four important watershed development agencies selected from different kinds of organizations in Gujarat state viz; i) CSWCRTI, Research Centre, Vasad from ICAR Institutes, ii) Gujarat State Land Development Corporation (GSLDC) from State Govt. development agency, iii) Aga Khan from NGOs and The Maharaja Sayajirao University (MSU) of Baroda from Traditional Universities. One well developed watershed was selected purposively from each selected organization such as i) Antisar watershed from CSWCRTI, Research Centre, Vasad, ii) Mokasar watershed from Aga Khan, NGO, iii) Soikuwa watershed from MSU, Baroda and iv) Gunata watershed from GSLDC, Chotaudaipur. Total respondents were 110 comprising 80 farmers (20 each from 4 watersheds) and 20 officials (5 each from 4 watersheds) and 10 extension scientists. Data collection was done by personal interview method through structured schedule. Frequency of use and effectiveness of extension methods were measured with the help of frequency use intensity index and effectiveness intensity index as given below:

**Frequency Use Intensity Index**

A five-point-continuum scale was developed to measure frequency of extension methods use and scoring was done as 1 for in a year, 2 for monthly, 3 for weekly, 4 for more than weekly and 5 for daily. Frequency use intensity index of different extension methods was computed by formula given below:

$$Frequency\ Use\ Intensity\ Index\ (FUII) = \frac{\sum_{i=1}^N FSi}{N} \dots\dots\dots(1)$$

Where, FSi = Frequency use scores assigned by respondents to the ith extension method, and N = Total number of respondents.

Categorization of frequency use intensity index values was done with help of Class Interval (CI) formula that is equal to maximum possible score minus minimum possible score divided by number of classes and computed as follows.

| <u>Category</u> | <u>Range of Intensity Index</u> |
|-----------------|---------------------------------|
| Low             | 1.00 2.33                       |
| Moderate        | 2.34 3.67                       |
| High            | 3.68 5.00                       |

**Effectiveness Intensity Index**

A three-point-continuum scale was developed to measure effectiveness of extension methods and with scoring values as 1 for less effective, 2 for effective and 3 for most effective. Effectiveness intensity index of different extension methods was computed by formula given below:

$$Effectiveness\ Intensity\ Index\ (EII) = \frac{\sum_{i=1}^N ESi}{N} \dots\dots\dots(2)$$

Where, ESi = Effectiveness scores assigned by the respondents to the ith extension method, and N = Total number of respondents.

Categorization of effectiveness intensity index values was also done similarly with help of the formula Class Interval (CI) used in case of frequency use intensity index.

| <u>Category</u> | <u>Range of Intensity Index</u> |
|-----------------|---------------------------------|
| Low             | 1.00 1.66                       |
| Moderate        | 1.67 2.32                       |
| High            | 2.33 3.00                       |

**3. RESULTS AND DISCUSSION**

**Frequency of Use of Extension Methods by Farmers**

Frequency use intensity indices (FUII) of different extension methods are presented in Table 1. It was observed that none of extension method was found for high level of intensity of index value. The moderate level frequency use intensity index values 3.41 and 3.34 were observed for radio and television respectively. The low level intensity index values were computed for documentary film show, exhibition, study tour, result demonstration and method demonstration as 0.40, 0.46, 0.53, 0.71 and 0.73, respectively. It shows that the majority of farmers used radio and television for information and adoption of different agricultural and SWC technologies. The extension methods, which were used rarely by farmers were documentary film show, exhibition, study tour, result demonstration and method demonstration. Singh et al. (2003) also reported that all the farmers have an access to radio and television.

**Table:1**  
**Frequency of use of different extension methods as perceived by farmers**

| Extension methods                | Frequency of Use of Extension Methods (%) |         |        |                          |       |                     |
|----------------------------------|---|---------|--------|--------------------------|-------|---------------------|
|                                  | Some time in a year                       | Monthly | Weekly | More than once in a week | Daily | Use Intensity Index |
| <b>Individual Contact Method</b> |   |         |        |                          |       |                     |
| 1. Farm and home visit           | 31.25                                     | 65.0    | 3.75   | 0                        | 0     | 1.72                |
| <b>Group Contact Methods</b>     |   |         |        |                          |       |                     |
| 2. Result demonstration          | 63.75                                     | 3.75    | 0      | 0                        | 0     | 0.71                |
| 3. Method demonstration          | 46.25                                     | 0       | 4.8    | 0                        | 0     | 0.73                |
| 4. Lecture                       | 40.0                                      | 10.0    | 6.25   | 7.50                     | 0     | 0.82                |
| 5. Discussion                    | 53.75                                     | 35.0    | 0      | 5.0                      | 0     | 1.67                |
| 6. Study tour                    | 83.75                                     | 10.0    | 0      | 0                        | 0     | 0.53                |
| <b>Mass Contact Methods</b>      |   |         |        |                          |       |                     |
| 7. Bulletin                      | 40.0                                      | 20.0    | 15.0   | 0                        | 0     | 1.25                |
| 8. Leaflet                       | 20.0                                      | 22.22   | 16.25  | 3.75                     | 0     | 1.28                |
| 9. Newspaper                     | 23.75                                     | 36.25   | 21.25  | 5.0                      | 7.5   | 2.17                |
| 10. Radio                        | 2.5                                       | 11.25   | 35.0   | 26.25                    | 21.25 | 3.41                |
| 11. Television                   | 0   | 7.5     | 32.5   | 21.25                    | 27.50 | 3.34                |
| 12. Exhibition                   | 36.25                                     | 5.0     | 0      | 0                        | 0     | 0.46                |
| 13. Documentary film show        | 40.0                                      | 0       | 0      | 0                        | 0     | 0.40                |

### Effectiveness of Extension Methods According to Farmers

Effectiveness intensity index (EII) was computed for different extension methods. As perceived by farmers, high level of effectiveness intensity index value was measured as 2.76 for farm and home visit in individual contact method. The high level effectiveness intensity indices were also calculated as 2.71, 2.70, and 2.51 for discussion, result demonstration and lectures respectively in the category of group contact extension methods. In mass contact extension methods, the high level of effectiveness intensity indices were calculated as 2.66, 2.56 and 2.55 towards documentary film show, exhibition and bulletin respectively. The Table 2 revealed that the highest effectiveness intensity index (EII) value (2.76) was recorded for "farm and home visit" method among all the three kinds of extension methods by the farmers. The less effective extension methods, as perceived by farmers, were method demonstration, leaflet and newspaper with moderate effectiveness intensity index values as 2.03, 2.06 and 2.13 respectively. The most effective extension methods as perceived by farmers for dissemination of SWC technologies were farm & home visit in individual contact, discussion and result demonstration in group contact and film show in mass contact. Arthur W. Peterson (1955) emphasized that farm and home visit is a method of teaching farm families, a systematic approach to management decisions for the farm and the home as an integrated unit. Sim and Hilmi (1987) reported that the most

effective way of bringing change is through individual contact in the home or the work place of people. Simute (1992) also reported that individual contact method as the best approach through which farmers learn better.

### Effective Extension Methods According to Officers

Table 3 shows the effectiveness intensity indices (EII) of different extension methods as perceived by officers of watershed development team and extension personnel. The high value of effectiveness intensity indices were recorded for farm & home visit (individual contact method), result demonstration, study tour, lecture and discussion (group contact methods) with EII values as 2.86, 2.70, 2.66, 2.60 and 2.40, respectively. Officers from among all three kinds of extension methods, considered farm and home visit method as the highly effective extension method with highest index value 2.86. None of mass contact methods could score for high effectiveness intensity category. The moderate effective extension method as perceived by officers was method demonstration (EII - 2.20) in group contact and in mass contact methods were bulletin (EII - 2.23), documentary film show (EII - 2.13), television (EII - 2.10), exhibition (EII - 2.06), leaflet (EII - 1.90), newspaper (EII - 1.86) and radio with low intensity index score of 1.63. It was found out that according to officers the most effective extension methods for dissemination of SWC technologies were farm and home visit, result demonstration, study tour and lecture.

**Table: 2**  
**Effectiveness intensity indices (EII) of different extension methods as perceived by farmers**

N=80

| Extension methods                | Effectiveness of Extension Method (%) |           |                |                               |
|----------------------------------|---------------------------------------|-----------|----------------|-------------------------------|
|                                  | Less effective                        | Effective | Most effective | Effectiveness Intensity Index |
| <b>Individual Contact Method</b> |                                       |           |                |                               |
| 1. Farm and home visit           | 7.5                                   | 8.75      | 83.75          | 2.76                          |
| <b>Group Contact Methods</b>     |                                       |           |                |                               |
| 2. Result demonstration          | 8.75                                  | 12.25     | 78.75          | 2.70                          |
| 3. Method demonstration          | 33.75                                 | 28.75     | 37.50          | 2.03                          |
| 4. Lecture                       | 13.75                                 | 21.25     | 65.0           | 2.51                          |
| 5. Discussion                    | 1.25                                  | 26.25     | 72.50          | 2.71                          |
| 6. Study tour                    | 6.25                                  | 41.25     | 52.50          | 2.46                          |
| <b>Mass Contact Methods</b>      |                                       |           |                |                               |
| 7. Bulletin                      | 10.0                                  | 25.0      | 65.0           | 2.55                          |
| 8. Leaflet                       | 33.75                                 | 26.25     | 40.0           | 2.06                          |
| 9. News paper                    | 28.75                                 | 28.75     | 42.50          | 2.13                          |
| 10. Radio                        | 20.0                                  | 31.25     | 48.75          | 2.28                          |
| 11. Television                   | 10.0                                  | 30.0      | 60.0           | 2.50                          |
| 12. Exhibition                   | 12.50                                 | 11.25     | 73.75          | 2.56                          |
| 13. Documentary film show        | 10.0                                  | 13.75     | 76.25          | 2.66                          |

**Table: 3**  
**Effectiveness intensity indices (EII) of different extension methods as perceived by staff of watershed development organizations and extension scientists**

N=30

| Extension methods                | Effectiveness of Extension Method (%) |           |                |                               |
|----------------------------------|---------------------------------------|-----------|----------------|-------------------------------|
|                                  | Less Effective                        | Effective | Most Effective | Effectiveness Intensity Index |
| <b>Individual Contact Method</b> |                                       |           |                |                               |
| 1. Farm and home visit           | -                                     | 4         | 26             | 2.86                          |
| <b>Group Contact Methods</b>     |                                       |           |                |                               |
| 2. Result demonstration          | -                                     | 9         | 21             | 2.70                          |
| 3. Method demonstration          | 3                                     | 18        | 9              | 2.20                          |
| 4. Lecture                       | -                                     | 12        | 18             | 2.60                          |
| 5. Discussion                    | 6                                     | 6         | 18             | 2.40                          |
| 6. Study tour                    | 2                                     | 6         | 22             | 2.66                          |
| <b>Mass Contact Method</b>       |                                       |           |                |                               |
| 7. Bulletin                      | 8                                     | 7         | 15             | 2.23                          |
| 8. Leaflet                       | 9                                     | 15        | 6              | 1.90                          |
| 9. News paper                    | 9                                     | 16        | 5              | 1.86                          |
| 10. Radio                        | 14                                    | 13        | 3              | 1.63                          |
| 11. Television                   | 7                                     | 13        | 10             | 2.10                          |
| 12. Exhibition                   | 5                                     | 18        | 7              | 2.06                          |
| 13. Documentary film show        | 9                                     | 8         | 13             | 2.13                          |

**Table: 4**

**Pooled effectiveness intensity indices (EII) of extension methods as perceived by farmers, officers of watershed development team as well as extension personnel**

N=110

| Extension methods                | Effectiveness of Extension Method (%)           |  |  |
|----------------------------------|---|--|--|
|                                  | Effectiveness Intensity Index by farmers (N=80) | Effectiveness Intensity Index by officers (N=30) | Pooled Effectiveness Intensity Index (N=110) |
| <b>Individual Contact Method</b> |   |  |  |
| 1. Farm and home visit           | 2.86  | 2.76   | 2.81   |
| <b>Group Contact Methods</b>     |   |  |  |
| 2. Result demonstration          | 2.70  | 2.70   | 2.70   |
| 3. Method demonstration          | 2.20  | 2.03   | 2.11   |
| 4. Lecture                       | 2.60  | 2.51   | 2.55   |
| 5. Discussion                    | 2.40  | 2.71   | 2.55   |
| 6. Study tour                    | 2.66  | 2.46   | 2.56   |
| <b>Mass Contact Methods</b>      |   |  |  |
| 7. Bulletin                      | 2.23  | 2.55   | 2.39   |
| 8. Leaflet                       | 1.90  | 2.06   | 1.98   |
| 9. News paper                    | 1.86  | 2.13   | 1.99   |
| 10. Radio                        | 1.63  | 2.28   | 1.95   |
| 11. Television                   | 2.10  | 2.50   | 2.30   |
| 12. Exhibition                   | 2.06  | 2.56   | 2.31   |
| 13. Documentary film show        | 2.13  | 2.66   | 2.39   |

#### **Effectiveness of Extension Methods as Perceived by both Farmers and Officers**

The pooled effectiveness intensity indices of different extension methods as perceived by farmers and officers of watershed development team as well as extension personnel are presented in Table 4. The high level pooled EII was recorded as 2.81 in case of farm & home visit in individual contact. In group contact, high level of pooled EII were recorded for result demonstration, study tour, lecture and discussion as 2.70, 2.56, 2.55 and 2.55, respectively. The high level pooled EII were also recorded to bulletin and documentary film show, in mass contact methods as 2.39 each. Therefore, the most effective extension methods as perceived by both farmers and officers were farm and home visit in individual contact, result demonstration in group contact and bulletin and documentary film show in mass contact methods. The highest effective method among all the three kinds of extension methods was farm and home visit with highest EII value 2.81.

#### **4. CONCLUSIONS**

The study concluded that the most effective extension methods as perceived by farmers as well as officers were farm and home visit in individual contact, result demonstration in group contact and bulletin as well as documentary film show in mass contact methods. Moreover, the farm and home visit extension method was

considered most effective extension method among all the three kinds of extension methods for dissemination of SWC technologies. It might be due to the reason that the farm and home visit method involves face-to-face contact of individual farmer with extension officer in field or watershed situation. Therefore, the farm and home visit extension method should be adopted by extension personnel and officers of state government development departments for effective and easy transfer of SWC technologies to farmers' fields for watershed management.

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