Mysore J. Agric. Sci., 50 (1) : 110-116, 2016

Scale to Measure the Forest Management Behavior of Village Forest Committee (VFC) Members

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ABSTRACT

An attempt is made to construct a scale to measure the forest management behavior of Village Forest Committee (VFC) members. However, the scale developed was found to be reliable and valid. The scale developed is useful to measure the forest management behavior of VFC members.The forest management behaviour scale developed was administered to 30 VFC members of Tumkur district. The study revealed that majority (77.00 %) of VFC members had average to better categories of forest management behavior regarding the forest management practices.

FOREST management is the way that forests and the trees within them are protected and used to provide forest products and other environmental benefits. In order to manage forest, the different objectives must be decided upon, and a work plan will be prepared spread across 10 years. Just like any farm management, the work plan to manage a forest means what work to do, where, when, and how. The efficient forest development, conservation and protection are possible only when people or communities are participating in this process. This experiment is going in different part of this world including India. Not many efforts are made to assess that the forest management behavior of people. Before starting forest management, the capacity and working process of those who are to do the work and benefit from it should be considered. This may be a community, family, individual, or other organization which will work in and benefit from the forest. Further, forest management includes the provision of wood and non-wood products, environmental services such as recreation, maintenance of biodiversity, and carbon sequestration. Increased pressure on forest resources of the country over the last few decades has threatened the livelihoods of millions of forest-dwellers and other poor people living in the vicinity of the forests. India's current forest and tree cover is estimated to be 96.2 million ha, constituting 23.81 per cent of the geographical area of the country (Anon., 2011). Forest resources have been important for the prosperity of any nation and its communities. However, many of the world's most vexing conservation problems result either directly or indirectly from people's everyday behaviors that, when multiplied by a global population of seven billion, places enormous pressures on habitats and natural resources, contributing to air and water pollution, land degradation and soil erosion, deforestation, species extinction, fishery depletion, water resource losses, and eventually climate change. Successful interventions to conserve species and natural resources must change human decisions and behavior, but efforts to alter the ways people think and act are often in effective, and may result in outcomes that are counter intuitive (Milner - Gulland, 2012), or even counter productive to conservation goals (Barrett and Arcese, 1998).

Concept of forest management behavior : The concepts of forest management and behaviour change have recently emerged as core areas of interested for forest conservation and protection agencies as well as to central governments. There are a number of departmental initiatives that focus on behaviour and behaviour change, most notably in relation to health, the environment, travel, and energy use. The forestry agencies and the wider forestry sector are increasingly interested in the concept of forest management behaviour, particularly as they relate to the principles, aims and objectives of sustainable forest management. This interest relates to two key categories of behaviour, first behaviour related to the sustainable management of trees, woods and forests, second positive behaviour brought about through interactions with trees, wood and forest. Despite the recent explicit focus on behavior and behaviour change, it is important to

acknowledge that this is not an entirely new topic area for the forestry sector. Much activity is already focused on encouraging particular types of behaviour within each of the categories above, such as woodland expansion and sustainable woodland management, physical exercise and renewable energy use. The forestry researchers are currently engaged to help situate forestry in relation to debates and discussions surrounding behaviour and behaviour change, and to explore ways in which behavioural insights might be used to inform sustainable forestry policy and management. However, forest management behaviour is nothing but the use of physical, financial, information and human resource for the management of the forest resources effectively and efficiently. However, research in psychology and behavioural economics can help to provide us with an understanding of the mechanisms at work in human actions and decision-making, and offer lessons to governments (Wintour, 2010). In turn, theoretically informed behavioral change strategies are likely to be more effective than ad hoc approaches (Dombrowski *et al.,* 2012; Glanz and Bishop, 2010; Taylor, 2012). While conservationists have acknowledged the importance of social science insights in meeting biodiversity targets (Keane *et al.,* 2012), challenges remain in translating the voluminous academic research which traverses the fields of psychology, economics, and neuroscience, among others in a way that is both accessible and relevant for practitioners. There has been relatively little application of behavioral research with respect to habitat, species, and natural resource conservation (St. John *et al.,* 2010), especially when compared to other fields like public health. The majority of empirical research on pro-environmental behavior has focused on energy use and recycling (Osbaldiston and Schott, 2012).

Present study: The forestry sector in India is among the first in the world to be managed on the lines of modern scientific management. Establishment of forest management from the middle of the eighteenth century incidentally coincided with the industrial revolution in the West. The forests emerged as important resources during the pre-independence period, as the demand for raw materials increased, and a need was felt to expand the railway network. Forestry was thus production-oriented at that time. However, the basic change in perception and behaviour of communities was brought by the National Forest Policy (NFP) of 1952, from production forestry to focus on meeting objectives of maintaining ecological balance on the one hand and meeting the needs of stakeholders in the best possible way on the other. In india, the criteria and indicators approach for sustainable forest management is being implemented on a pilot basis since 2000. The initiative, known as the Bhopal - India process, has over the years endeavored to formulate a working frame work for the achievement of the goals of sustainability specific to the national forestry conditions. Forests provide a wide range of ecological, economic and socio cultural benefits for the communities with proper forest management behavior, enhancing their quality of life. However, the dynamics of forest management behaviour in a developing country is unique, as the multiple uses of forests are clearly felt in a multi-stakeholder environment. Further, the application and monitoring of criteria and indicators by the communities together with effective institutionalization and capacity-building can provide us tool store to view the progress toward sour goals of sustainability. And few research studies were conducted to access the forest management behavior of people, focusing on developing, conserving and protecting the forest resources. Hence, the present research is taken up with the following specific objectives:

1) To develop and standardized a scale to measure the forest management behaviour of VFC members.

2) To understand the overall management behaviour of village forest committee (VFC) members.

METHODOLOGY

a) Development of a scale to measure forest management behavior of VFC members : Management behaviour is operationally defined as use of physical, financial, information and human resource for the management of the forest resources effectively and efficiently by Village Forest Committee (VFC) members.The method of summated rating suggested by Likert (1932) and Edwards (1969) was followed in the construction of the scale. The steps followed as follows.

b) Collection of items : Tentative list of 85 statements pertaining to the management behaviour was prepared based on the available literature and discussion with forest agricultural extension and the other experts from selected areas.

c) Editing of items: Out of 85 items / statements which are reflecting to the management behaviour of VFC members was prepared through extensive review of literature and discussion with scientists. The items / statements so identified were carefully edited in the light of 14 criteria suggested by Edwards (1969) and Thurstone and Chavue (1929). Eighty statements were retained after considering the 14 criteria. The eighty statements were finally retained after editing process.

a) Relevancy Test : Eighty items / statements were sent to 750 judges spread across State Agricultural Universities, Central Agricultural Universities and Indian Council of Agricultural Research institutions as well as to some University and research institution's experts in Afghanistan with necessary instructions to critically evaluate each item / statement as to its relevancy to measure the management behavior of VFC members and give their response on four point continuum *viz.*, Strongly Agree (SA), Agree (A), Dis Agree (DA) and Strongly Dis Agree (SDA) with the score of 4,3,2 and 1, respectively. In all, 80 judges could respond in time. The relevancy score for each item / statement was found out by adding the scores on the rating scale for all the 80 judges. From the data so gathered "Relevancy Percentage", "Relevancy Weightage" and "Mean Relevancy Score" were worked out for all items/ statements by using the following formulae :

Where

$$\text{Relevancy percentage} = \frac{(MR\times4) + (R\times3) + (SWR\times2) + (NR\times1)}{\text{Maximum possible score}} \times 100$$

$$\text{Relevancy weightage} = \frac{(MR\times4) + (R\times3) + (SWR\times2) + (NR\times1)}{\text{Maximum possible score}}$$

$$\text{Main relevancy weightage} = \frac{(MR\times4) + (R\times3) + (SWR\times2) + (NR\times1)}{\text{Number of judges responded}}$$

MR = Most relevant
R = Relevant
SWR = Somewhat relevant
NR = Not relevant

Using these criteria, individual statements was screened for its relevancy. Accordingly, the items / statements having relevancy percentage of more than

Item details of the forest management behavior Scale

Items / statements	Number of items before editing	Number of items after editing	No. of items after item analysis for administering the scale
Planning	12	10	10
Organizing	10	6	2
Staffing / Functioning	10	4	3
Directing / Guiding	9	5	3
Coordinating	10	6	3
Controlling	12	8	4
Reporting	10	6	3
Budgeting	12	5	5
Total	**85**	**50**	**33**

85 per cent, relevancy weightage of more than 0.85 and Mean Relevancy score of more than 3.0 were considered for the final selection. By this process, 57 statements were isolated in the first stage which were suitably modified and written as per the comments of judges wherever applicable.

Item Analysis : For item analysis, the responses of the respondents were arranged in ascending order based on management behaviour scores. 25 per cent of the subjects with the highest total score and 25 per cent with the lowest total scores were selected. These two groups are considered as the criterion groups in terms of which item analysis was conducted and critical ratio was calculated by using the following formula :

$$t = \frac{\overline{X}_H - \overline{X}_L}{\sqrt{\frac{\left(\Sigma \overline{X}_H^2 - \frac{(\Sigma \overline{X}_H)^2}{n}\right) \times \Sigma \overline{X}_L^2 - \frac{(\Sigma \overline{X}_L)^2}{n}}{n(n-1)}}}$$

Where,

$\bar{X}_H$ = Individual scores in the high group

$\bar{X}_L$ = Individual scores in the low group

n = Number of respondents

Based on the item analysis ('t' value), Thirty three items / statements were found non-significant**,** indicating the agreement on this rating among the judges and they were finally retained in the scale to measure the management behaviour. Thirty three items / statements which were statistically non- significant means there is no any variation among the judgments and hence these statements were retained to measure forest management behaviour of VFC members. These statements spread across seven dimensions: planning (ten statements), organizing (two statements), staffing / functioning (three statements), directing / guidance (three statements), coordinating (three statements), controlling (seven statements) and budgeting (five statements).

a) Reliability : Reliability refers to the precision or accuracy of the measurement or score. A well-made scientific instrument should yield accurate results both at present as well as over time (Ray and Mondal, 2011). The split-half method was employed to test the reliability of the perception scale. The value of correlation co-efficient was 0.6883 and this was further corrected by using Spearman Brown formula and obtained the reliability co-efficient of whole set. The 'r' value of the scale was 0.8154 which was higher than the standard of 0.70 indicating the high reliability of the scale. It was concluded that the perception scale constructed was reliable.

b) Validity : Validity of the test is the accuracy with which it measures that which is intended to measure. Construct validity was employed to measure the validity of the scale. The Validity co-efficient for the scale was 0.9030, which was also greater than the standard requirement of 0.70 indicating the higher validity of the developed scale. Hence, the scale is valid. Thus, the developed scale to measure forest management behaviour of VFC members was feasible and appropriate.

Forest management behavior of the VFC members : The final scale of thirty three items / statements (Table I) was finalized to assess the forest management behaviour (FMB) of the respondents along with four point continuum representing 'Strongly agree', 'Agree', 'Dis agree' and 'Strongly dis agree' with weightage of 4, 3, 2 and 1, respectively and vice versa for negative statements. The forest management behaviour score of a respondent can be calculated by adding up the scores obtained by him / her on all items / statements. The management behavior score of this scale ranges from a minimum of 33 to a maximum of 132. Higher score on this scale indicates that the respondent has better forest management behaviour.

a) Overall forest management behaviour of VFC members : It is found from Table II that 80.00 per cent of VFC members possess coverage to better forest management behaviour and 20.00 per cent of VFC members had poor forest management behaviour. This might be due to the extension education efforts made by the VFC President, Member Secretary, Forester, Motivator, Range Forest Officer and Deputy Conservator of Forest as these people are posting better communication skill and this has helped to

TABLE I

Statements to measure forest management behaviour of VFC members

SA- Strongly Agree, A-Agree, DA- Dis Agree and SDA- Strongly Dis Agree.

Statements	SA	A	DA	SDA
Planning				
1. Micro planning enables Village Forest Committee (VFC) members to reach sustainable solutions to Village Forest Committees (VFCs) problems				
2. Planning enables sustainable development of VFCs				
3. Planning promotes efficiency in forest conservation and developments				
4. Planning provides resource utility more judiciously				
5. Planning facilitates systematic implementation of the work				
6. Planning helps in problem solving process in forest management				
7. Planning is sustainability to meet current and future requirements of the VFC members				
8. Planning facilitates the development and conservation of forest resources				
9. Planning facilitates to create awareness about the importance of forest at grassroots level				
10. Planning facilitates conservation, protection and development of forest resources				
Organizing				
1. Joining Forest Planning and Management (JFPM) organizes awareness and training programmes conducted by the forest department for the VFCs				
2. Organization facilitates discussion and helps in deciding executive members of VFC				
Staffing / Functioning				
1. Deciding on the description of job and responsibilities of VFCs members				
2. Deciding on flexibility in terms of attending the VFC work				
3. Organization facilitates membership drive to enroll every adult villagers to become VFC member				
Directing / Guidance				
1. JFPM enables members the right of use of forest resources through VFCs				
2. Rewards and incentives are provided by the VFCs to develop the forest resources				
3. VFCs create social fencing for forest protection				

Statements	SA	A	DA	SDA
Coordinating				
1. There is a good relationship with forest department and other line departments				
2. Enables free and frank communication among all the stock holders of the JFPM				
3. Facilitates the conflict management through negotiation / discussions skills				
Controlling				
1. Utmost care is undertaken with respect to natural resources management practices				
2. VFC take care of free access to members				
3. VFC members take care in illegal firing and control				
4. Provide plan for future programme				
Reporting				
1. Sharing of information with donors, supporting agencies and other members				
2. Indicating the ongoing nature of the programme through milestone				
3. Facilitation of information and report sharing				
Budgeting				
1. Estimating the budget for implementing the VFCs activities.				
2. Amount required is estimated for land , buildings, forest , equipment and infrastructure and other livelihood activities				
3. Budget is presented in general body meeting of VFC members				
4. Transparency budgeting facilitates the forest development and ownership by VFC members				
5. Awards and incentives promote of tree planting				

established good credibility among VFC members in the village, so the VFC members have developed better forest management behavior and they have taken proper decision during the planning and implementing forest activities. However, the government of India provided needful fund through JFPM programme and village development fund as well as self-finance of VFCs by their income generation activities from forest and non-forest products.

The forest management behaviour scale developed is found to be reliable and valid; hence it can be used to measure the forest management behaviour of VFC members. The developed scale can be used by researchers to measure forest management behaviour of people across the globe. The forest management behaviour scale developed was administered to 30 VFC members of Tumkur district to find out the how far they are managing the forest resources. The study revealed that majority (77.00 %) of VFC members had average to better categories of forest management behaviour regarding the forest management practices. It can be concluded that the scale developed is useful in explicitly measuring the forest management behaviour of VFC members.

TABLE II

Overall forest management behaviour of the VFC members

(n =30)

Categories	Livelihood status of farmers	
	Number	Per cent
Poor (<119 score)	6	20.00
Average (119-123 score)	17	57.00
Better (>123 score)	7	23.00
Total	30	100.00

Mean = 121.4, Standard Deviation = 4.31

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(*Received :* December, 2015 *Accepted :* February, 2016)