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Promoting sustainable collective action: lessons from behavioural sciences

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Abstract

Several tools and techniques are used by psychologists and the counsellors for behaviour shaping. Some of the techniques such as contingency management of reinforcement, modelling procedures and rational emotive approaches have considerable relevance for community groups. In community development activities, rights and incentives provided for motivating community members act as reinforcement for collective management of resources. If the benefit flow from collectively managed resources increases, it further acts as reinforcer. The extension activities such as exposure visits to some exemplary cases or success stories provide as models for communities. The participatory exercises, community meetings and other sensitization activities act like rational emotive approaches of behaviour shaping.

This study has been carried out in south Rajasthan where Joint Forest Management approach has been implemented for nearly two decades. The delivery and process of community development activities in selected villages were analyzed in each community to understand how they compared with the community behaviour shaping approaches. This was then related to the effectiveness of community institutions.

The results indicated decline in effectiveness of institutions in many cases which was primarily associated with absence of proper scheduling of reinforcement while delivering development activities. While in some cases sustained collective action was observed where a combination of factors motivated community members. In overall, it was evident that collective action remained sustained when the combination of rights, incentives, benefits and sensitization processes was delivered in a manner that they acted as reinforcers of the desired behaviour. Based on these observations, a strategy of delivering a combination of development interventions is discussed to promote sustainable community institutions.

Key words: Behaviour shaping, participatory forest management, contingency management, collective action, reinforcement

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INTRODUCTION

Several tools and techniques are used by psychologists and the counsellors for shaping behaviour of individuals. Many such tools have been successfully used for counselling in small group situations like classroom, industries or organisations etc., though still targeting the behaviour of individuals (Hansen et al., 1976; Brophy, 1986; Wolfgang, 2001; Charles, 2002; Schulz, 2003; Milford et al., 2007). This paper is aimed at examining the potential of behaviour shaping strategies used for individuals to be applied in the community environment to enhance their behaviour for collective action (to achieve the goal of sustainable forest management).

Behaviour modification in individual environment is dependent on limited factors, which are relatively easy to analyse and control. Nevertheless, modification of behaviour of many individuals for their collective goal is more complex. Variation in the level of understanding of individuals may hinder their agreement for a common action. More external factors play role in community situation causing it difficult to control. However, peer pressure in community environment can be favourably used for collective action. The community group experience gives individuals an opportunity to explore issues in more depth, in a setting which more closely resembles work, study, social and family groupings.

Behaviour shaping

The term shaping refers to the process of learning a complex response by first learning a number of simple responses leading upto the complex one. Each step in the process is learnt by the application of contingent positive reinforcement, and each step builds on the one before it until the complex response occurs and is reinforced. Thus the actions leading to the desired behaviour outcomes also reinforce further action. In other words, when an individual gets something he wants as a result of a particular action, the result of his action reinforces the action (Felker, 1974:31; Skinner, 2005). The change in knowledge or availability of information and exposure to other events or successes also affects the beliefs and influences behaviour. Based on these broad considerations, psychologists and counsellors have developed different techniques of behaviour shaping, mainly applied to individuals (Skinner, 2005; Miltenberger, 2008).

Some of the techniques used in individual behaviour shaping such as contingency management of reinforcement, modelling procedures and cognitive techniques such as rational emotive approaches have considerable relevance for community situation. Development practitioners have been using different activities and providing incentives which compare with these behaviour shaping approaches. Contingency management refers to the administration of reinforcement following the action. In community development activities, rights and incentives (in terms of investment) are provided to community members for motivating them to take up the responsibility of protecting and regulating the resource use. This could be compared with the provision of reinforcement in behaviour shaping strategies. The increased benefit flow from collective resource management also acts as a motivator for community members for rational collective management. This can be an important self-reinforcer for behaviour shaping.

The exposure visits and success stories provide as models for motivating the communities. Cognitive techniques aim at modifying the thought patterns of the community members by providing them information about importance and ways of community forest management. Participatory exercises, community meetings and other sensitization processes compare well with rational emotive approaches.

Considering the greater relevance of application of reinforcement strategies, this is described in detail here along with the important considerations for its effectiveness.

Reinforcement

Reinforcement is technically defined as anything that follows a response and increases the probability of the response occurring again (Felker, 1974:31). This approach of seeking positive response in behaviour in fact also includes the omission of reinforcement or the punishment or decrease in reinforcement. This is not only to increase the desired behaviour but strategically it also includes decreasing the undesired behaviour. The reinforcement may be materialistic or social but it must be attractive to the one(s) whose behaviour is to be shaped.

There are several other conditions that need to be considered to make the reinforcement effective such as its timing, objectivity, and social recognition etc. Reinforcement will be most effective when it is delivered immediately following the desired response. It should be clear for what response it is being given. When an individual is expected to acquire an extended sequence of behaviour it may be necessary to insert reinforcement into the sequence while it is being learned.

Technically reinforcement can be of various types and accordingly they have the influence on the outcomes. This is represented in a typology by Morgan et al. (1993) and is given in Fig 1. A positive reinforcement is a stimulus event, which, when follows a response, increases the likelihood that the response will be repeated again. This can be even achieved when undesired behaviour is to be controlled through omission of reinforcement. Punishment or the negative reinforcement similarly can be very effective in some circumstances in shaping behaviour, when a certain type of response is to be decreased or is to be increased.

Scheduling Reinforcement

The reinforcement can be given according to some prearranged plan. If the reinforcement is contingent for every occurrence of a particular response, it is called continuous reinforcement. Under these conditions the acquisition of a particular behaviour is likely to be quite rapid, but upon the cessation of reinforcement, extinction also occurs quite rapidly. Thus this schedule may be used in shaping a particular behaviour in the beginning but other schedules are likely to be employed later in order to increase the endurance of the response.

In contrast to continuous, scheduling can be intermittent in which not every response is followed by reinforcer. The acquisition of desired behaviour is generally less rapid

if the intermittent schedule is used from the start though it may be sometimes rapid and sometimes slow. Intermittent schedule can be of different types based on at what interval or in what ratio it is given. The attributes of different types of schedules and likely impact is given in Table 1.

Fig 1. Different types of reinforcements used in behaviour modification

	Nature of the Event Which Follows − Is Contingent on − a Response	
	Appetitive (Approached or sought, e.g., water for thirsty animal)	Aversive or noxious (e.g., electric shock)
Onset of event following response	Positive reinforcement (Increases likelihood of response)	Punishment (Decreases likelihood of response)
Termination of event following response	Omission of reinforcement (Decreases likelihood of response)	Negative reinforcement (Increases likelihood of response)

Consequence of response

Table 1. Types of reinforcement schedules

A. Continuous	Every appropriate response is followed by reinforcement	Acquisition of behaviour is rapid but upon the cessation of reinforcement, extinction also occurs rapidly
B. Intermittent	Not every response is followed by a reinforcer. Rather reinforcement is given intermittently	Acquisition is less rapid (if used from the start), with rapid response sometimes, slow at other times. Extinction is less likely
(i) Fixed Interval	Reinforcement is given after fixed periods of time and are not tied to individual's behaviour	Tend to produce and maintain behaviour with pauses after the receipt of each reinforcement
(ii) Variable Interval	Reinforcement is given after variable periods of time and are not tied to an individual's rate of behaviour	Produces steadier response
(iii) Fixed Ratio	Every nth response is reinforced and thus reinforcer is given after a	It may be useful way in which to 'lean out' a continuous schedule

	(iv) Variable Ratio	The ratio between the number of responses and reinforcement changes from time to time	Tend to produce steady and high rates of response without the pause with affixed ratio behaviour. Extinction is less likely
		particular level of achievement	

Different types of schedules may be appropriate in different situations. For community-based participatory forest management, continuous schedule can be used in the beginning but it should be gradually transformed into an intermittent one (variable ratio) and then gradually as environmental and self contingencies become increasingly effective, it could be gradually phased out completely.

Desired Behaviour in Participatory Forest Management

Collective action is desirable from community members when they are expected to manage commonly held natural resources. For this all the community members need to agree on a commonly expected behaviour. As a desired behaviour, this requires participation in the decision making process and compliance by the decisions. Participation should be of all the members including women, who are often not consulted. The system of enforcement of decided regulations requires some duties and responsibilities for the members. Thus the protection against illicit use by members or outsiders has to become a desired behaviour. Abidance of decided regulations and equitable sharing of products are also desirable by community members.

There is another important consideration about the activities which could be undesirable and should not be done by the members. For example, cutting of trees or removal of grass or other products from the forest area managed, when it is against the decided regulation, would be undesirable. Thus, non-indulgence in undesirable behaviour is also an essential component of desired behaviour of community members.

MATERIALS AND METHODS

This paper analyses the process of promoting community involvement in management of forest resources as being implemented by the Forest Department in Rajasthan state in India. The case study villages selected for analysis in this paper are from Udaipur district. An intensive programme of reforestation was carried out in Udaipur district using participatory approach since 1993. There are more than 100 villages in which forestry development activities have been taken up at different times through various schemes and in which the second author has remained administrator at different intervals. Out of these six particular villages were selected in which a variety of activities have been carried out which are generally carried out by the Forest Department. Reforestation work for 2-5 years had been carried out in each of these villages, though at different periods of time. This covered the

significant part of available forest lands in these villages. The population statistics and the extent of reforestation work carried out in the selected villages along with other development activities are given in Table 2, which could be compared with reinforcement strategies.

In two of the villages i.e. Palyakheda and Salukheda, non-forestry development activities such as entrepreneurship training programmes, construction of water retention structures, facilities for irrigation and drinking water supply systems, health camps, and other such activities of rural utility had been taken up during 1997 to 2000. This was aimed at providing reinforcement for motivating people for taking up protection and rational management of forest resources. However, in terms of delivery these activities were once sanctioned were to be delivered without actually making them dependent on the response. Similarly, watershed development programmes had been initiated in three of the villages (Palyakheda, Amleta, and Unkaliyat) in the year 2001 by the Forest Department. These programmes, manly carried out for three years, had provisions for taking up soil and water conservation works and other activities for improving production on private agricultural lands as well as common lands. Thus, the sample provided variation in level and timing of forestry or other development activities taken up in the villages that affected the level and continuity of contact of forestry staff with the villagers.

In the year 1999, when the second author took over the responsibility of administration in one of the divisions in Udaipur district, it was noticed that in most of the villages, the strength of collective regulation declined as no serious follow up was continued after the closure of the programmes in particular villages. At this stage, intensive efforts to motivate community members were started which were targeted to sensitise community members about the rational and benefits of collective action and on encouraging participation of women. For covering all these relevant issues, periodic meetings were held, generally quarterly. Various participatory tools and visualisation techniques were used during this process. All these efforts were also targeted at improving cognition level of people.

Impact assessment

Periodic assessment of the different aspects of community behaviour and the resource conditions was carried out to understand the impact of various interventions at different times. The assessment of resource condition was done through transact walks with the community members keeping in view the succession of grasses, survival and the growth of planted seedlings, natural regeneration, and the damage of resources, if any. The resource conditions were scored on 0-10 scale, in which 10 score indicated no unregulated damage of resources while 0 score indicated complete open access.

The evaluation of different aspects of community behaviour was carried out through five indicators relating to the basic functions of deciding and implementing collective actions for maintaining forest and other complementary resources. This is indicated in participation of members (including that of women), protection of resources from illicit and unregulated use, abidance of rules for extraction and sharing of different products from the area. The performance was judged against the desired

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performance standards on a 0-10 scale. Semi-structured group and individual interviews with representatives of the communities was done for this purpose and committee records were also examined to assess the scores.

The assessment on both the aspects was carried out prior to initiation of intensive sensitization efforts in June-August, 2000. To understand the impact of the intensive sensitization efforts, an assessment was repeated during May-June, 2001, after nearly one year of initiation of these efforts. The villages selected for this study were such in which authors had previously done some studies during 1995 based on which, the assessment scores were recorded after triangulating the information from different sources. Similarly, the assessment scores were also recorded during 2005 in the same villages to understand the long- term influence of the past efforts.

RESULTS AND DISCUSSION

The results of the assessment for resource conditions (Table 2) as well as community behaviour (Table 3) are discussed separately. Since the intensive sensitisation efforts for mobilising collective action were made only during the period of one year between 2000 and 2001, the change during this period is elaborately discussed.

Impact on resource conditions

The assessment of resource conditions (Table 2) in 1995 indicated that when no reforestation activity and effort for mobilising community participation was initiated in Palyakheda, no resource use regulation existed. However, with the initiation of participatory reforestation activities in all other villages, community regulation on resource use was established, although its effectiveness varied due to some inherent factors within the community and because of external factors of mobilisation capacity of staff. The assessment was repeated in 2000 after completion of reforestation activities in some of the villages. This indicated that forest regeneration process was progressing well in Palyakheda, as indicated by no unregulated damage. Nevertheless there were signs of occasional unregulated exploitation in rest of the five communities, and its extent varied. The extent of damage was highest in Bada Bhilwara (score 6.5) and Salu Kheda (score 6.5). The damage was moderate in Malpur (score 7.0) and relatively less in Amleta (score 7.5) and Unkaliyat (score 7.5).

The condition of resources did not evince any noticeable change in two assessments in 2000 and 2001 made at an interval of nearly one-year. However, there was some decline in resource conditions by 2005 in most of the communities except Amleta and Palyakheda, where unregulated use of the resources was almost absent. This indicated the increase in unregulated use of resources in other four communities and thus raising a doubt on sustainability of reforested areas in these villages. This indicates that impact of reinforcement in Amleta and Palyakheda had sustained for longer time. The level of sensitisation was higher in these two villages due to staff involvement and presence of active local leaders. In these two villages, even the watershed development activities continued up to 2003, which also acted as

reinforcement. The watershed development activities were continued in Unkliyat also up to 2003 but the impact did not last after that. There was some difference in the level of mobilisation efforts among the villages as well. Lack of sensitivity and capacity of change agents or the forestry staff has been observed to be one of the major area of concern (Jackson, 1997; Vasan, 2002; Bhattacharya and Basnyat, 2003; Pani, 2003; Puri, 2004; Krishna, 2004).

The decline in resource conditions in other villages is indicative of the fact that when reinforcement in terms of reforestation investment was discontinued, the extinction of learnt behaviour became visible.

Impact on community behaviour

The scores for the different aspects of community behaviour (Table 3), assessed in 1995 indicated that in all those villages where some reforestation activities had been initiated, the level of involvement was much higher compared to where (Palyakheda) no efforts were initiated. The process of micro-planning and reforestation activities during the early project implementation acts as reinforcer. The early implementation process also requires frequent meetings with the local communities, which helps in improving the community cognition.

The second assessment carried out in 2000, prior to initiation of intensive sensitization efforts, showed considerable variation. There was considerable decline in the level of involvement in Malpur in last five years. This seems to be linked to no reforestation activities taken up in this village in last 3-4 years. The scores, in general, were relatively higher in the villages where forestry or other development activities had continued during the current and/or preceding year. In Bada Bhilwara, the scores were better because the community institution was functional for nearly last 15 years. This had helped in developing a regular system of meetings and monitoring of enforcement of community regulations.

The third assessment was carried out in 2001 after intensive sensitizing efforts for about a year. The overall score for the level of community involvement, and the change in the scores for individual attributes during one-year period, evinced improvement in the overall scores in all the communities, at least to some extent. This indicates that the sensitization efforts had some impact. This impact was higher in communities in which some development activities have been taken up even in the current year through watershed development programme, which provided reinforcement for generating greater community interest and involvement.

This is indicative of investment dependence of people which is becoming a commonly observed phenomenon (Saxena, 2000; Kumar, 2000; Bebarta, 2003; Sowmitri et al., 2003; Kapta, 2004; Kumar and Puri, 2004; Mansuri and Rao, 2004). It is obvious that when development investment is continuing in a community, the implementation process and the monitoring requirements provide opportunities for greater interaction among the development agency staff and the community members. The pursuance of the agency staff with the communities is also greater in such villages during this period. People, in general, and the indigenous communities, in particular, remain concerned more for their short-term interests (Joshi, 1995; Jain,

1995; Jain and Jain, 1998; Chandra, 2000). Availability of wage employment through development investment remains an immediate concern and people seem to be less concerned for long-term sustenance (Saxena, 2000).

There are several instances in which development practices and the policies have destroyed highly effective social networks and norms (Putnam, 1993; 1995; Putnam et al., 1993) or such programmes have failed to develop effective community institutions (Poffenberger, 1990; Sarin, 1996). On the contrary, there are several instances in which self-initiated community groups have revived and managed resources sustainably without the support or the intervention of development agencies (Kant et al., 1991; Singh and Singh, 1992; 1993; Poffenberger et al., 1996; Poffenberger and Others, 1996, Sarin, 1996; Conroy, 2000). This is primarily because these groups realised responsibilities of regulating and managing resources in their self-interest.

Depending upon the local conditions and the nature of resources, some development investment may be necessary or desirable, but it is important that it is made in a way that the community commitment is rewarded rather than creating investment dependence. This can be achieved by linking of rights and incentives (in the form of development investment) with the responsibilities, as elaborately discussed in a good practice manual for community-managed forestry programmes by Jain (1998). In this strategy, progressive investment is made dependent on the community commitment and abidance with collective regulations in periodic assessments.

The analysis of change in the scores for individual parameters of the evaluation scale, after nearly one year of efforts, indicates that improvement in scores was visible in most communities in the level of 'protection from illicit use' and 'participation', more so in case of 'women'. This appears to be resultant of intensive gender sensitisation efforts for improving the effectiveness of community institutions (FAO, 1989; McGean et al., 1996; Sarin and Others, 1997; Jain and Jain, 2002). Involvement in protection is one of the main responsibilities that are expected from communities in JFM (GOR, 1991; 2000) and therefore, the level of protection immediately improves as a result of realisation of their responsibilities (Poffenberger and others, 1996; Negi, 2001).

The assessment of community behaviour carried out in 2005 indicated that there was a general decline in the overall level of involvement in all the communities except in Amleta, where a strong sense of community action seems to have taken roots. The decline in Palyakheda was only marginal or insignificant. In this village, the reforested area is also providing significant amount of forest products to benefit the local community members, which has also helped in sustaining their interest. No reforestation activities or any other village development activities were taken up in these villages except for the watershed development activities in three of the villages which were started in 2001 and majority of these activities continued until 2003. The general decline in overall score as well as individual attributes in other communities is indicative of the fact that after the withdrawal of reinforcement in terms of reforestation activities, in the absence of continuous sensitisation and motivation, involvement of community members tends to decline. It is also apparent that despite considerable investment for reforestation and other development activities, the

response of the communities was not generally favourable, because the investment (schedule) was not made dependent on community response leading to faster extinction of learnt behaviour.

CONCLUSIONS AND RECOMMENDATIONS

From the above analysis and discussion of the results, following broad generalisations can be drawn for achieving greater success in participatory reforestation programmes:

1. The reforestation projects aiming to achieve sustainable management of resources through community-based approaches should strongly provide for continuous efforts for sensitisation and motivation of community members. These should be well planned and carried out by skilful persons to have better impact on the community members at their cognition level.
2. Such efforts often need to be combined with some development activities in villages which can provide them incentives in terms of resource development and wage employment. This should be made in a way that it does not create dependence for continuous investment. Initial investment may be necessary to initiate interest for some period, but the progressive investment should be made only as a reward for continued community commitment about their responsibilities as established through periodic assessments. This amounts to providing reinforcement for every desired response in community behaviour, which should be clarified to community members in the beginning itself.
3. The resource development and management plans should be developed with participatory approaches in the beginning which should include various forestry or non-forestry development activities chosen based on the community felt needs that could be supported through progressive investment.
4. This may be required for a few years till the resource being developed starts providing enough returns to sustain the community interest in regulating the resource extraction and use. As the benefit flow increases, it acts as self-reinforcement. However, withdrawal of investment should also be done in a phased manner.
5. There is a strong need for strengthening the facilitation role of the change agents or the implementing agency staff to cover the above aspects.
6. Besides keeping appropriate number of facilitators, it is equally important to create motivating environment for them to improve their level of sincerity and involvement. There is an obvious need for creating an environment and system in which there is a greater motivation and rewards for learning and performance for the change agents.
7. For the success of any reforestation project, a regular process of periodic assessment is needed which should not only assess the resource performance but also include the assessment of community actions and processes so that it provides pointers towards the weak areas and suitable steps can be taken overcome them. The desired behavioural aspects can be emphasized in this manner and can be better reinforced through appropriate activities.

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