

EXPERIENCES WITH ON-FARM FEED SUPPLEMENTATION TRIALS IN INDIA, USING A PARTICIPATORY APPROACH

LES EXPERIENCES AVEC DES ESSAIS DE FERME SUR LES SUPPLEMENTS D'ALIMENTS CAPRINS EN INDE EN UTILISANT UNE APPROCHE PARTICIPATIVE

C. CONROY (1) AND D.V. RANGNEKAR (2)

(1) Natural Resources Institute, Central Avenue, Chatham Maritime, Kent, ME4 4TB, UK

(2) BAIF, Dr. Manibhai Desai Nagar, N.H. 4, Warje, Pune 411 029, India

Summary

The adoption of technologies developed by researchers, for enhancing fodder production and improving grazing management systems, has been poor. A participatory approach to technology development (PTD) can help to ensure that new technologies are appropriate to livestock-keepers' needs and circumstances, and hence increase the likelihood of adoption. This paper describes the feed supplementation trials conducted in India by a research project that is seeking to take a participatory approach, and assesses to what extent the postulated benefits of PTD have been realised, and the factors affecting this.

Résumé

L'adoption des technologies développées par des chercheurs pour améliorer la production d'aliments et la gestion des pâturages a été faible. Une approche participative au développement des technologies (PTD) peut aider à assurer que des nouvelles technologies soient appropriées aux besoins et conditions des éleveurs, ainsi augmentant la probabilité d'adoption. Ce papier décrit les essais sur les suppléments d'aliments caprins qui ont été conduits en Inde par un projet de recherche tentant à prendre une approche participative. Aussi, il évalue jusqu'à quel niveau les bénéfices postulés du PTD ont pu être réalisés et les facteurs les affectant.

Background

Scientists have acquired a tremendous amount of knowledge about the feed resources and nutrition of ruminants, both large and small (Acharya and Bhattacharyya, 1992). Despite this, the adoption of technologies developed by researchers, for enhancing fodder production and improving grazing management systems, has been poor (*ibid.*; Sidahmed, 1995). This is partly because feed technologies have often been developed without the involvement of the intended users, and without an adequate understanding of their farming systems and constraints.

A participatory approach to technology development (PTD) can help to ensure that new technologies are appropriate to farmers' and livestock-keepers' needs and circumstances, and hence increase the likelihood of adoption (Conroy *et al.*, 1999; Reijntjes *et al.*, 1992). Greater participation of the intended users can mean, *inter alia*, that: farmers' knowledge and experience can be incorporated into the search for solutions, and highly inappropriate technologies can be 'weeded out' early on; and researchers receive rapid feedback, enabling promising

technologies to be identified, modified and disseminated more quickly.

Livestock research and development work has tended to lag behind crop production work in the development and application of methods for PTD. There are relatively few documented examples of projects in which livestock are a central focus, particularly ones addressing feed issues. However, there has been increasing recognition that livestock research needs to give greater emphasis to farmer participation (Sidahmed, 1995).

Since October 1997 BAIF Development Research Foundation (India) and the Natural Resources Institute (UK) have been managing a three-year research project to identify and address feed-related constraints affecting goat production in north-west India. The project aims to develop technologies to ease or remove the constraints identified, based primarily on a *collaborative* relationship with goat-keepers, as described in Table 1. This is more participatory than the *contract* and *consultative* modes, which have probably been the ones most commonly used in on-farm livestock research. (The degree of farmer

involvement increases in the modes to the right hand side of the table.) This paper describes the feed supplementation trials conducted by

the project. It then assesses to what extent the postulated benefits of PTD have been realised, and the factors affecting this.

Table 1 Four Different Modes of Farmer Participation in Agricultural Research

1. Contract	2. Consultative	3. Collaborative	4. Collegiate
Farmers' land & services are hired or borrowed: e.g. researcher contracts with farmers to provide specific types of land	There is a doctor-patient relationship. Researchers consult farmers, diagnose their problems and try to find solutions	Researchers and farmers are roughly equal partners in the research process & continuously collaborate in activities	Researchers actively encourage & support farmers' own research & experiments

Source: Biggs, 1989.

Methods

Diagnosis and needs assessment

The BAIF/NRI project team began by doing surveys in several villages in three districts of north-west India. The surveys involved rapid rural appraisals with groups of goat-keepers, using semi-structured interviews and mapping and diagramming. The surveys generated descriptions of the goat production and feeding systems. In PTD it is essential to identify priority needs: simple ranking was used to identify major problems and their relative importance, and the results of the ranking were generally cross-checked with other survey findings. If an important feed-related problem was identified through the group discussions, more detailed livestock productivity data (e.g. on kid mortality) were often sought subsequently through individual interviews, as such data can help to identify critical periods in the nutrition of the animals. In the second year of the project this kind of data was collected using the 'herd history' method, based on the owner's recall and use of cards to symbolise each goat in the herd.

The trials

The project then established some on-farm trials that focused on supplementation of feed at critical points in time to address the problem identified. The process of designing, monitoring and evaluating the trials was intended to involve goat-keepers actively. The trials, which all took place during the dry season, were designed with a treatment and control group in the same village, so that a 'with/without' comparison could be made. In the 1998 trials the project contributed 66% or 100% of the cost of the treatment. In the 1999 trials this was reduced to 50% or 66%.

Monitoring and evaluation In most trials there was fortnightly monitoring of goat

productivity parameters (e.g. milk production), and monthly meetings with participants to discuss how the trials were progressing. Joint evaluation meetings were held at the end of the trials.

Results

Results of treatments in relation to problems identified

Three priority problems were identified that appeared to be (at least potentially) feed-related. The production systems are different in each district, hence the feed-related problems are too (see Table 2).

The UMG trial in Bhavnagar had the intended effect of increasing milk production, but the size of the increase was limited and goat-keepers said that they would like any further feed supplementation trials to take place around the time of kidding, rather than in the dry season. In both of the Bhilwara trials the treatment was effective, in that the kidding rates of does in the treatment groups were significantly higher than those for does in the control groups (Conroy *et al.*, 2000). In the two Udaipur 1998 trials and the 1999 trial the effects of the treatments were difficult to isolate, due to confounding factors.

Results in relation to degree of goat-keeper participation

The actual degree of goat-keeper participation in the design of the trials has been moderate in relation to: (a) relating the trials to priority needs; and (b) the determination of the treatment (see Table 3). The reasons for this are discussed in the concluding section.

Table 2 Problems, Supplements and Classes of Goats in the On-farm Trials

District (State)	Main product	Feed-related Problem (or opportunity)	Supplement (all given at 250g/day)	Goats targetted
Bhavnagar 1998 (Gujarat)	Milk	Low milk production in dry season	Trial 1. Urea/molasses granules (UMG)	Lactating does
Bhilwara 1998 (Rajasthan)	Meat	Sub-optimal reproductive performance of does	Trial 2. Mixture of <i>Prosopis juliflora</i> (PJ) pods and barley	Breeding does
Udaipur 1998 (Rajasthan)	Meat	Disease-related mortality in kids early in the rainy season	Trial 3. Barley Trial 4. Urea/molasses granules	Kids
Bhilwara 1999 (Rajasthan)	Meat	Sub-optimal reproductive performance of does	Trial 5. Mixture of <i>Prosopis juliflora</i> (PJ) pods and barley Trial 6. PJ pods only	Breeding does
Udaipur 1999 (Rajasthan)	Meat	1 Disease-related mortality? 2 (Rapid maturation of females)	Trial 7. Barley	Kids

Addressing of a priority need To ensure the active involvement of goat-keepers in PTD it is essential that the research is addressing a need that they regard as important. The researchers generally *sought* to address a priority need of the goat-keepers. However, in four of the trials it is questionable whether the project actually *succeeded* in doing so (see Table 3), due to inadequate discussions with goat-keepers about the precise nature of the constraint and/or the suitability of the proposed treatment to address it.

Determination of treatment In all of the trials it was the researchers who identified the type of supplement to be used. However, this was based on knowledge of livestock-keepers' experiences with similar technologies in other localities. In most trials, the participants appeared to agree that the proposed treatment was a sensible one, and contributed 33-50% of the cost of the treatment. In Trials 6 and 7 goat-keepers were more actively involved in determining the treatment, in the latter case having the major say in the daily quantity.

Table 3 Indications of the Degree of Goat-Keeper Participation in the Trials

Trial – number, supplement & year	Overall mode of participation*	Was a Priority Need Addressed?	Who Decided Nature of Treatment?	Joint Evaluation?	Is treatment likely to be adopted?
1. UMG – 98 (Bhavnagar)	1/2	X ¹	R	✓	X
2. PJ pods & barley – 98	2	✓	R, with G-Ks' agreement	✓	✓ (with modification)
3. Barley – 98	2	?	R, with G-Ks' agreement	✓	X
4. UMG – 98	2	?	R, with G-Ks' agreement	✓	X
5. PJ pods & barley – 99	1/2	✓	R	✓	✓ (with modification)
6. PJ pods – 99	3	✓	R/G-K jointly	✓	✓
7. Barley – 99	2	?	R/G-K jointly	✓	X

*Code: 1 = Contract 2 = Consultative 3 = Collaborative. R = Researchers. G-Ks = Goat-keepers

¹ The research in Bhavnagar subsequently (in 1999) focused on addressing water scarcity in the dry season, which the goat-keepers had identified as their main constraint.

Conclusions

Technology development is a gradual and iterative process. Thus, a number of trials may be required before a technology is developed that meets livestock-keepers' priority needs and is suitable for adoption. The experience of this project appears to confirm the widely held view that the more and the sooner farmers and livestock-keepers are involved in the research process, the more rapidly appropriate technologies will be identified.

Factors facilitating increased participation

A high degree of participation (such as type 3 in Table 1) is not usually possible from the outset. However, if researchers are committed to achieving it there is likely to be a gradual shift along the spectrum towards greater participation. In the experience of the BAIF/NRI project this may be due to one or more of the following factors: (a) development of positive rapport between researchers and participants when successive trials are conducted in the same village, as illustrated by Trials 2 and 5; (b) improved understanding of problems (illustrated by the Bhavnagar experience – see Table 3 footnote) or opportunities (e.g. Trial 3 identified an opportunity that was then explored further in Trial 7); (c) the efficacy and profitability of the technologies is demonstrated (Trials 2 and 5), or improved through modifications (the aim of Trials 6 and 7); and technologies found to be ineffective are abandoned (Trial 1).

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Factors hindering a participatory approach

The shift towards a collaborative relationship with farmers is not automatic. It is important to be aware of, and to address, factors that may hinder the adoption of a participatory approach. These include (see also Conroy *et al.*, 1999): (a) researchers lacking experience and orientation in PTD; (b) pressure to move quickly from the diagnosis and needs assessment phase to the establishment of trials (due to the short lifetime of some projects), resulting in inadequate needs assessment; (c) small project budget, resulting in insufficient staff time to encourage full farmer involvement; (e) late scheduling of project activities (related to previous point); and (e) staff turnover and involvement of inexperienced staff.

Prospects for adoption The ultimate test of the appropriateness of the technology tested is whether or not participants show evidence of adopting it. It is too early to say yet whether the technologies developed will be adopted by goat-keepers. This will become clearer when all of the 1999 trials have been analysed and evaluated, and when a further round of trials has been conducted in the year 2000. However, the PJ pods/barley treatment has proved to be effective and produces net benefits (Conroy *et al.*, 2000); and there is strong evidence of goat-keeper interest in the treatment or a modification of it. The net benefits need to be increased by modifying the treatment to reduce costs: Trial 6 is investigating one approach to this.

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