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ESTABLISHMENT OF FODDER NURSERY FOR DAIRY DEVELOPMENT

The establishment of fodder nursery and distribution of fodder seeds/root slips among the farming community through integrated and participatory extension approaches is essential for dairy development. Dr Prakashkumar Rathod, Dr Vivek Patil, Dr Channappagouda Biradar, Dr Anant Rao Desai and Mr Dattu Reddy share their experiences of fodder nursery establishment and promotion of fodder production under Sujala-III project implementation in Karnataka (India).

CONTEXT

Among the various issues to be addressed in the Indian dairy sector, fodder production and feeding has been a critical element for improved production and productivity. Over the years, although various attempts have been made to promote fodder production at field conditions, there has been a poor response from the farmers for fodder cultivation and feeding which might be due to major constraints like lack of awareness and inputs, pressure on land for cultivation of food/commercial crops, poor socio-economic status of the farmers, shrinking of common property resources etc. Further, the attitude and knowledge level of the dairy farmers also plays a pivotal role in adoption of recommended animal husbandry practices including green fodder cultivation and feeding.

It should be noted that livestock producers meet their fodder requirements through a combination of crop residues, grazing (on common lands, private lands, forests, fallow agricultural

lands and harvested agricultural lands) and cultivated forage crops (mostly by large landholders), while some of them purchase fodder. However, there is an acute shortage of green and dry fodder and lack of scientific information in the farming community about fodder production. In this context, various initiatives have been undertaken by multifarious agencies (public, private, NGOs etc.) for promoting green fodder production and distribution of fodder seeds/root slips at institutional and farmers' levels. These agencies are also involved in establishing fodder seed production farms and fodder nurseries to support the production and availability of improved fodder seeds. These farms also serve as demonstration and training units for fodder production and promotion. The seeds/root slips of native species, which have a higher chance of surviving, are distributed at a nominal rate among the farmers to encourage fodder production. On similar lines, various research and extension projects have focused on establishment of fodder nursery and distribution of fodder seeds/root slips among the farming community through integrated and participatory extension approaches for dairy development.

We therefore emphasized on establishment of fodder nursery as demonstration plots and carried out distribution of fodder seeds and root slips for the benefit of other farmers in the project villages. Further, this project has also addressed the constraints faced by the project staff and the farmers in this project activity.

THE INITIATIVE

The good practices discussed in this note are from the project villages of the World Bank-funded, Karnataka Watershed Development Department (KWDP)-sponsored Sujala-III project. This project has been implemented by the Veterinary College, Bidar which is under the aegis of the Karnataka Veterinary, Animal and Fisheries Sciences University (KVAFSU), Bidar (Karnataka) during last two years viz. 2015-16 and 2016-17. The development objectives of Sujala-III project is to demonstrate more effective watershed management through greater integration of programmes related to rainfed agriculture, innovative and science-based approaches and strengthen institutions and their capacities with the involvement of individual farmers and member farmers of producer organisations (for example: Karnataka Milk federation, private milk societies etc.). We undertook a study on this initiative mainly to understand the process and impact of this initiative (Box 1).

Box 1. Methodology of the Study

- Purposive sampling technique was used for selecting Bidar district since Sujala-III project was implemented in this district by Veterinary College, Bidar.
- A baseline survey of about 790 farmers from 14 project villages identified by the Government of Karnataka (India) and various meetings/ awareness programmes in the project villages paved the way for creating knowledge and interest about fodder nursery establishment and green fodder production at farmers' field.
- Two farmers were identified for establishment of nursery in the year 2015-16 and later, two other farmers were identified for establishment of nursery in the year 2016-17. This nursery presently consists of five/six different varieties of fodder depending on the field conditions and farmers' situation.
- These beneficiary farmers had milking animals during the study period and they sold their milk to the primary cooperative milk societies in their villages.
- Awareness programmes, trainings, field days and demonstrations about fodder production and its importance were conducted by multi-disciplinary teams for the beneficiaries. A before-after research design was followed for the study to know the impact of these programmes in the project villages.
- Pre-exposure and post-exposure attitude tests, knowledge tests and adoption studies were conducted in the project villages, focusing on the objectives of the scheme, before and after conducting the awareness and demonstration programme.

GOOD PRACTICES

Awareness programmes, trainings and demonstrations: Multi-disciplinary teams conducted awareness programmes and trainings on fodder production practices for the beneficiaries. Demonstrations of land preparation, collection of root slips, sowing of fodder seeds or root slips, fertilizer/manure application, harvesting of fodder etc. were conducted. Further, the beneficiaries also participated in focus group discussions about different practices and issues under the guidance of experts or project staff.

Technical staff/human resources: The project involved technical staff for establishing fodder nurseries, for creating awareness about the project activities and the importance of green fodder production. The technical staff detailed the farmers about scientific agricultural and agronomical practices for fodder production and feeding. Timely advisory services by the technical staff helped the beneficiaries to a great extent.

Fodder nursery and demonstration plot established: Two farmers were identified for establishment of nurseries and demonstration plots in the year 2015-16, and two more farmers were identified in the year 2016-17. The nurseries in 2015-16 (July and November 2015) consisted of nine fodder varieties at farmers' field with 2 *guntas* (202.4 square metres) for each variety. However, it was realised that only five varieties were suitable for that area. With this experience, fodder nurseries initiated in the year 2016-17 (July 2016) consisted of only six varieties each among these varieties, viz. Dharwad Hybrid Napier-6 (DHN-6), Hybrid Napier Co-4, Multi-cut sorghum CoFS-29, *Stylosanthes hamata,* Guinea grass, Rhodes grass and *Sesbania grandiflora*. Presently, the fodder production yield and area under fodder production has increased over a period of time and is discussed in this good practice.

Access to inputs: Inputs such as fodder seeds, root slips and stem cuttings were distributed to the beneficiaries. Fertilizers, manure etc. were also provided to farmers on a timely basis. Project staff educated them about agronomical and agricultural practices. Very recently, a plan for drip irrigation for the fodder nursery has been initiated with some financial contribution from the beneficiaries also.

Farm literature and video: Farm literature and reading material were distributed to all beneficiaries. A video was also developed in the local language and displayed for the farmers' benefit. This video is available at https://www.youtube.com/watch?v=I2LV2y2zWGw&t=21s

Convergence of multiple stakeholders/actors: Multifarious agencies such as the World Bank; Karnataka Watershed Development Department; Veterinary College, Bidar; Livestock Research and Information Centre (Deoni), Bidar under Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar; State Department of Agriculture; State Department of Animal Husbandry and Veterinary Services; individual farmers and member farmers of producer organisations (Karnataka Milk Federation) were involved in the project.

BENEFITS AND IMPACT

- **Increase in fodder production and farmers' interest:** There is an increase in the number of interested farmers to establish fodder nurseries in the project villages. Despite many challenges at the field level, the project team was successful in increasing the area under fodder production and the fodder yield over a period of time. Although there was negligible fodder production through conventional methods, presently the fodder production has a range varying from 4.20 tonnes to 35.70 tonnes per acre for individual farmers. The farmers are even procuring fodder seeds from the nearby veterinary institutions through Government of Karnataka. Further, a few farmers have purchased fodder seeds and root slips from the university livestock farm and private commercial distributors. As a whole, about 45 farmers have initiated fodder cultivation production in the project villages with exclusive plots for fodder production.

- **Horizontal diffusion of fodder production practices:** The fodder nursery establishment and fodder production in the project villages has motivated other farmers to adopt this practice. A total of eight farmers have procured root slips and stem cuttings from the farmers within the project villages, indicating a horizontal diffusion of the practice. Further, other farmers not under the project villages have also procured these seeds and root slips for cultivation. These newly adopted farmers have cultivated fodder from a range of 2 *guntas* (202.4 square metres) to 20 *guntas* (2024 square metres) in their fields. This result indicates that farmers have realised the importance of green fodder production in dairying.


- **Preference for fodder cultivation:** There was a positive change in the attitude of beneficiaries about green fodder production and establishment of fodder nursery. Initially, the farmers considered this practice non-profitable and difficult to adopt at field condition due to non-availability of inputs and lack of scientific knowledge. At present, due to field days and awareness programmes, a good number of farmers in the project area have shown an inclination towards fodder cultivation and feeding. Earlier, farmers preferred to cultivate food crops and never allotted land for fodder production. With the introduction of the project, beneficiaries have initiated fodder production due to realisation of minimal investment in terms of land and labour.

- **Improved knowledge level of dairy farmers:** The overall knowledge level of the farmers about fodder production and its importance has increased after imparting trainings and various programmes through the project. The knowledge retention level was found to be about 68% 30 days after the trainings and field visits.

- **Improved quantity and quality of milk:** Field-level observations have confirmed that the problems of less milk yield and low levels of fat and solids not fat (SNF) were solved to a great extent by feeding the green fodder to dairy animals. Farmers who fed their animals green fodder are getting higher prices for their milk as compared to other farmers in the project villages. Also, these farmers follow scientific feeding practices which include dry fodder, green fodder, concentrate feeding, chaff cutting, conservation of surplus fodder etc. As expected, consumption of green fodder has improved the overall health status of the dairy animals.

- **Improved economic returns:** Interventions carried out in this project for increased availability of green fodder were aimed at increased milk production and reduced cost of milk production, thereby resulting in increased economic returns to livestock producers. Major characteristics of the interventions were low cost of establishment, relatively short wait for benefits, preference to perennial type of fodder varieties and observable benefits. The farmers have varying range of income benefits, depending on the area under cultivation and the fodder varieties cultivated. On the whole, it was found that income from single harvesting of each variety of fodder was in the range of Rs 32,000/- to Rs 90,000/- per acre. Furthermore, the farmers have saved the money that they would have spent for purchasing fodder from other sources.

- **Promotion of suitable fodder variety:** Among 10 varieties which were introduced in the project villages, only 5-6 varieties could grow well in the field condition. The farmers also shared their experience that Dharwad Hybrid Napier-6 (DHN-6) had very good yield and was highly palatable to dairy animals. This is multi-cut, hardy, perennial fodder which can be harvested once in about 80-90 days. On the basis of field-level experience, this fodder crop is being promoted in the project area for the benefit of the farming community and this is being communicated to field-level extension officers.

- **Silage making by beneficiary farmers:** Project beneficiaries who established fodder nurseries also practiced silage making, realising the importance of conserving surplus green fodder. Silage-making demonstrations were conducted by the project team and the inputs such as silo bags were provided to the farmers to encourage silage production.

LESSONS LEARNT AND CHALLENGES FACED

The project clearly revealed that an integrated approach of extension activities viz. training, demonstration, on-farm testing, farm literature etc. can promote adoption of scientific practices by sensitisation and improving the knowledge level of farmers. The programme has achieved the expected target and has convincingly demonstrated fodder development in extremely difficult situations, ensuring that farmers and communities have timely access to fodder seeds, planting materials and other inputs. There is an increase in income generation, quality and quantity of milk yield, area under fodder cultivation and horizontal diffusion of fodder production practice.

However, during the initial phase, this project faced various problems and challenges which are depicted below:

- Project beneficiaries were not aware of the importance of growing fodder crops and hence, cultivated food/cash crops on their land. Talking to the farmers about fodder production and the need for it in the initial period was a challenging task for the project team. Nevertheless, the team made efforts to motivate the beneficiaries and strengthen their scientific knowledge.
- It was very difficult for the project team to explain the difference between fodder nursery, demonstration plot and conventional fodder production plot. Although farmers were

informed about the objective of fodder nursery, they harvested it for feeding their dairy animals and hence required regular follow-up visits and field-level observations.

- Of the two fodder nurseries established in 2015-16, one failed due to poor commitment from the farmer, lack of irrigation facilities and prevailing drought in the region. This beneficiary farmer had completely replaced the fodder nursery with other agricultural crops. This indicated that environmental factors play a major role in fodder nursery establishment and promotion of fodder production.
- Heavy rain in September and October 2016 created damage to the fodder production plots in the project area. Among five fodder varieties, the plots were left with either two or three varieties and recovered after a considerable period of time. Ultimately, drought and heavy rain have affected fodder production in consecutive years.

POLICY IMPLICATIONS

Though the project received poor response from farmers initially, integrated extension approaches helped the project team in improving the knowledge level of farmers and adoption of fodder production practice with very low investment. A policy shift emphasising delivery of inputs and regular follow-up for carrying out an integrated extension approach is very critical to enhance production and productivity.

- There is a need to focus on promotion of region-specific and palatable fodder varieties based on the field experience. Urgent efforts need to be made to utilise the common grazing lands to maximise benefits to the farming community. On the same lines, commercialisation or entrepreneurship in green fodder production can also be developed to meet fodder requirements of adjoining regions.
- Although this project has achieved success to some extent, there is a need to emphasise fodder production to a larger extent by supporting farmers through inputs delivery and need-based extension approaches, since farmers have limited understanding about fodder production and its importance.
- The horizontal diffusion of fodder production practices, i.e. distribution of fodder seeds and root slips among the farming community, would continue for a long term since farmers have realised the importance of fodder production. Nearby farmers have also made an attempt to contact the concerned farmers or institutions to adopt this practice since it is essential for

enhancing profits in dairy farming. Further, this interest of farmers and adoption of fodder production practice is expected to continue even after the completion of this particular project in the project villages.

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