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Transformative impact of KVK Baramati's collaborative interventions in the dissemination of silage production technology

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Abstract

Since 1974, Krishi Vigyan Kendras (KVKs) have been pivotal in disseminating innovative agricultural technologies to farming communities. The Agricultural Development Trust's KVK in Baramati has effectively collaborated with both public and private sectors to promote silage technology in Pune District, addressing the critical forage shortage faced by dairy farmers, particularly from March to July. With 50% of the cattle population being crossbred, the availability of green fodder year-round is essential for maximizing milk production. Silage technology has been identified as a solution, offering benefits such as reduced labor costs, year-round fodder availability, and improved milk yield. Through Participatory Rural Appraisal (PRA), KVK identified forage scarcity and implemented various silage preparation methods, including the surface tank, pit, and polypropylene bag methods. Training sessions and demonstrations facilitated by partnerships with organizations like the National Dairy Development Board and Tasty Bite Foundation have educated thousands of farmers, resulting in the adoption of silage-making practices across 458 villages and benefiting over 16,000 farmers. The initiative has led to a 22% increase in milk yield in rainfed areas, contributing to better economic stability for dairy farmers. This study highlights the impact of collaborative efforts in technology dissemination, emphasizing that collective action can significantly enhance agricultural extension work, improve farmer livelihoods, and promote sustainable dairy farming in Maharashtra.

Keywords: Intervention, collaboration, Public-private partnerships (PPPs), farmer empowerment, sustainable agriculture

Introduction

Since, 1974 Krishi Vigyan Kendra's are playing important role in dissemination of advance innovative technologies to the framing communities within stipulated time. In this context different modes of extension methodologies were utilized for dissemination of technologies. Agricultural Development Trust's (ADT) was established in 1971 with the aim of dedicated service for Indian farming community. ADT, Baramati is one of the leading agricultural research and development organizations. It serves as parent body of Krishi Vigyan Kendra (KVK), Baramati a nationally and internationally recognized farm science center renowned for its innovative contribution to the agriculture. Agricultural Development Trust's (ADT) Krishi Vigyan Kendra (KVK), Baramati has worked in collaborative way with Public & Private sector for dissemination of silage technology among the farming community in Pune district. Collaboration involves a process where individuals or groups with varying perspectives on an issue can constructively engage with one another to uncover solutions that extend beyond their individual viewpoints. This collaborative effort allows different people and organizations to assist one another by utilizing and merging their unique strengths and capabilities effectively (Gray, 1989, Lasker, Weiss, & Miller, 2001) [7, 8].

As per as importance of silage technology is concerned Dairy enterprise is a major income generating activity in the *rainfed* and irrigated area of the Pune District in Maharashtra. Maize and sorghum is a major fodder crops grown by the dairy farmers. Out of total population of cattle in the Pune District 50% population is crossbred animals, for maximum milk production crossbred animals require green fodder throughout the year. Area under fodder crops is 5% of

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total area of the District. Green fodder is not available throughout the year. Sugarcane tops are also available from November to March in the area due to Sugar factories. There is shortage of green fodder during March to July for animals. Livestock farming is secondary source of income for medium, small and marginal farmers. Due fodder shortage in summer's season farmers from rain fed area before 2011 -12 are using sugarcane tops and Sugarcane for feeding to cross bred animal which leading to mal nutrition, low productivity, repeat breeding problems and dairy farmers has to replace their animals after 3-4 years because low Body condition score of crossbred cows leading to economic loss to dairy farmers. If annual rain fall is less than 400 mm then farmers has to send their animal to Animal camps as green fodder is not available for feeding to animals or they have to purchase sugarcane tops, Sugarcane from irrigated area. Benefits of Silage Making are described below as:

- 1. Reduces Cost and Labor Time:** Silage making significantly lowers the time and labor required to transport fodder from the field to the cattle shed. Instead of making multiple trips to gather fresh fodder, farmers can prepare and store silage in advance, which streamlines feeding routines and allows for more efficient use of labor resources.
- 2. Year-Round Availability of Green Fodder:** One of the key benefits of silage is that it allows for the preservation of green fodder, making it available throughout the year. This is especially important during periods of drought or off-season when fresh fodder is scarce. With silage, farmers can ensure their livestock have consistent access to nutritious feed, improving overall animal health.
- 3. Increase in Milk Production and Fat Percentage:** Studies have shown that silage can lead to a 22% increase in milk production and a 6% increase in fat percentage. This boost is attributed to the enhanced nutritional quality of silage compared to traditional fodder, which supports better lactation performance in dairy cows. Higher milk yields can significantly improve farmers' income and contribute to economic stability.
- 4. Increase in Dry Matter Intake:** Silage generally has a higher concentration of nutrients and dry matter compared to fresh fodder. This allows livestock to consume more nutrients in a smaller volume of feed, leading to improved digestion and overall health. Increased dry matter intake supports better growth rates and reproductive performance in cattle, contributing to the sustainability and productivity of dairy operations.

Overall, silage making offers a range of benefits that enhance both the efficiency of farming operations and the health and productivity of livestock Bilal *et al.* (2021) [3]. Hence, ADT's KVK, Baramati has identified the 'Silage technology' is solution for this burning issue and simultaneously worked with different agencies & institute for popularization of this technology. Present investigation deals study of impact of collaborative work

done by different agencies in dissemination of silage technology.

Materials and Methodology

Technological Interventions by KVK, Baramati

ADT's KVK, Baramati, collected data from rural communities in Pune district through Participatory Rural Appraisal (PRA) and identified a shortage of forage for animal feeding from March to July (Chambers, R. 1994) [4]. KVK recognized that using silage technology for preparation and storage of silage could help to address this forage scarcity. There are following methods of silage preparation

1. Surface tank method
2. Pit method
3. Poly propylene bag method

Trainings & Demonstrations of these technologies along with inputs were provided to the farmers by KVK. Collaborative outputs were given as follows

Collaborative Outputs technology partners

1. Training and demonstrations on silage preparation Under NICRA
2. National Dairy Development Board, (NDDB) Anand (Year 2013-2017.)
3. Agricultural Technology Management Agency (ATMA), Pune
4. Maharashtra Agricultural Competitiveness Project, (MACP)
5. Testy bite foundation has worked with KVK for popularization of this technology in 16 villages.
6. KVK Baramati provided guidance & critical inputs like silage culture, plastic paper for pit silo Method to Farmers. Also, popularized the technology through Krushik Exhibition.

Results and Discussion

Under NICRA project, an initiative was undertaken by KVK, Baramati to provide training and demonstrations on silage preparation to dairy farmers. Initially in the year 2012 only three farmers had adopted this silage preparation Technology for preparation of silage from Maize fodder crop. This technology proved to be the effective solution for scarcity of forage during March to July. Even it has increased the milk yield of farmers. By seeing the success of these farmers one proposal for silage making programme was submitted to NDDB, Anand under FD-I, by ADT, KVK, Baramati & the proposal under NDP-I for Fodder Development was sanctioned by the NDDB Anand to ADT, Baramati. It was implemented by KVK, Baramati during Year 2013-2017 (Table No. 1) total 4650 beneficiaries were benefited from 234 villages. Under NDP-I program 90 units of Silage making Demonstration in Surface silo (20 MT), 2 Bio-mass Bunker for storage of dry fodder, 10 Manual and Auto mower for silage making Demonstration, 9 MT Fodder Seed and 90 Training and Method Demonstration on Silage preparation were given to the beneficiaries.

Table 1: Details of Training and demonstration conducted by KVK, Baramati & in collaboration with NDDB Anand under NDP-I (Fodder Development Programme-I)

Sr. No.	Component of FD-I	Units	No. of Villages	Total No. of Beneficiary
1	Silage making Demonstration in Surface silo (20 MT)	90	90	90
2	Bio-mass Bunker for storage of dry fodder	2	1	1
3	Manual and Auto mower for silage making Demonstration	10	44	2338
4	Fodder Seed Production	9 MT	9	157
5	Training and Method Demonstration on Silage preparation	90	90	2064
	Total		234	4650

The Agricultural Technology Management Agency (ATMA) serves as the agricultural extension agency in the state. During an ATMA Governing Body meeting, KVK Baramati discussed the technology and applicability of silage making. Due to the success of this technology, the Project Directorate of ATMA,

Pune, has approved a Silage Making Training Program and Demonstration for seven tehsils in Pune district for 2017-2018. Due to this collaboration two trainings programs were conducted & 574 Poly Bags silage making demonstration were given to total 1094 farmers (Table No. 2).

Table 2: Details of Training, Method Demonstration & Demonstration conducted by KVK, Baramati & in collaboration with ATMA, Pune.

Year	Particulars	No.	No. of Farmers	No. of Tehsil
2017	Training & Method Demonstration	01	197	7
	Silage making Demonstration in poly Bags	197	197	7
2018	Training & Method Demonstration	1	350	7
	Silage making Demonstration in poly Bags	350	350	7
Total			1094	



Training programme organized in collaboration with ATMA

Tasty Bite foundation a private company critically analyzed the success of this technology and collaboratively worked for dissemination of Poly Bag method of silage technology from 2021 to 2023 in 16 villages (Table No. 3). Due to this collaboration KVK was able to conduct seven Training & Method Demonstrations and given 22 units of Silage making Demonstration in poly Bags. As result, KVK with the help of Tasty Bite foundation KVK was able to give inputs of technology to 390 farmers in 16 villages.

Table 3: Details of Training and demonstration conducted by KVK, Baramati & in collaboration with Tasty Bite foundation.

Year	Particulars	Nos.	No. of Farmers	No. of Villages Covered
2021	Training & Method Demonstration	2	63	3
	Silage making Demonstration in poly Bags	20	20	3
2022	Training & Method Demonstration	3	90	3
	Silage making Demonstration in poly Bags	1	37	3
2023	Training & Method Demonstration	2	120	2
	Silage making Demonstration in poly Bags	1	60	2
Total			390	16

Moreover, under Maharashtra Agricultural Competitiveness Project, (MACP) programme KVK received approval for 60 fodders production demonstrations.

Apart from this, KVK individually worked for dissemination of Silage technology in regular program. Since, 2013 to 2024 KVK conducted 47 trainings under OFT's & FLD's which has benefited 1617 beneficiaries. In all total 3000 leaflet published and supplied during training Method demonstration.

Table 4: Details of Training Programme

Year	No. of Training	Male	Female	Total
2013	2	183	20	203
2014	4	160	3	163
2015	8	176	2	178
2016	1	15	0	15
2017	3	97	0	97
2018	4	88	0	88
2019	3	158	0	158
2020	2	58	0	58
2021	4	32	43	75
2022	6	159	55	214
2023	7	120	59	179
2024	3	81	108	189
Total	47	1327	290	1617

To empower the farming community in India, ADT's KVK Baramati organizes the Krushik-Live Demo Agricultural Expo annually at the KVK instructional farm, where advanced innovative technologies are showcased through live demonstrations. The Krushik Exhibition has supported farmer

empowerment initiatives such as Farmer Producer Organizations (FPOs), Self-Help Groups (SHGs), and start-ups, promoting collective farming models that lead to improved income opportunities and resource sharing (Dheeraj Shinde *et al.*, 2024)^[5]. A total of 54 demonstrations were conducted during the Krushik event and in the field, benefiting 4,66,718 farmers across India (Table No. 5 and Figures No. 1, 2, and 3).

Table 5: Method Demonstrations on field and during Krushik

Year	No. of Method Demonstrations	No of Farmers
2017	16	257216
2018	5	36005
2019	2	35580
2020	8	33034
2021	8	34375
2022	7	35347
2023	8	35161
Total	54	4,66,718



Fig 1: Method Demonstration on silage Making



Fig 2: Method Demonstration on silage Making



Fig 3: Method Demonstration on silage Making

Impact of KVK, Intervention on silage making

Recognizing the success of silage making technology, KVK Baramati has made "Silage Culture" available to farmers. It was found that using silage culture not only reduced wastage but also improved the quality and aroma of the silage. Due to the success of this technology, more than 16,000 farmers in Pune District have adopted silage making practices. During each Krushik Technology Week, demonstrations of the silage making method

have led to the adoption of this technology by farmers from neighboring districts in Maharashtra. Additionally, a TV program on SAM TV was broadcast in 2015 to promote awareness and knowledge about silage making. Due to the demonstrations of the silage making method during each Krushik Technology Week, farmers from neighboring districts in Maharashtra have adopted this technology. Additionally, a TV program on SAM TV was broadcast in 2015 to promote silage making. The milk yield in rain-fed villages has increased by 22% compared to 2011. Nowadays, farmers are not replacing their milking cows due to malnutrition in these *rainfed* areas.

Large scale impact: Silage making technology is adopted on large Scale in Baramati, Daund, Indapur, Purandar, Haveli, Velha & Bhore Tehsils of Pune District. This silage technology is adopted by 458 villages. In total 16676 farmers from these seven tehsils adopted the silage technology (Table No. 6 & Fig. No. 4).

Table 6: Impact of KVK, Intervention on silage making

Name of the Tehsil	No. of village adopted the Technology	No. Farmers adopted silage Making technology
Baramati	106	5830
Daund	95	3325
Indapur	116	4060
Purandar	98	2450
Haveli	35	770
Velha	3	115
Bhor	5	126
Total	458	16676

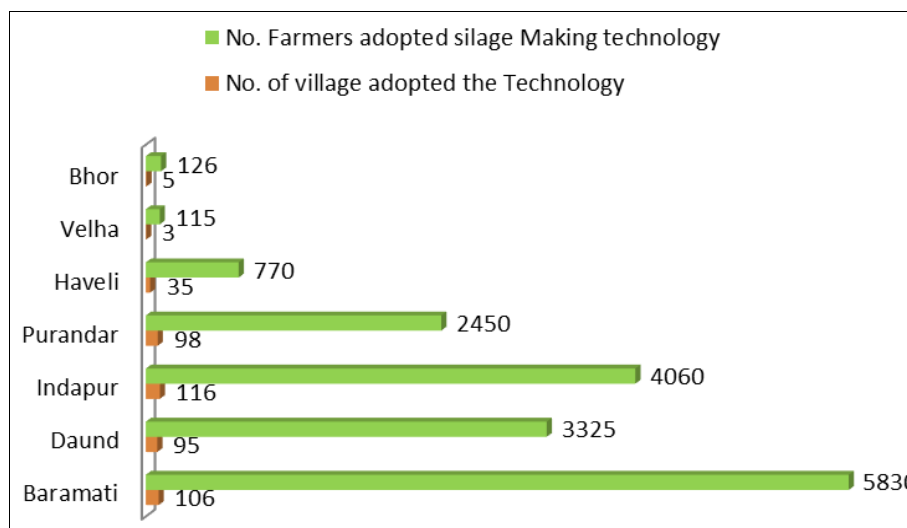


Fig 4: Impact of KVK, Intervention on silage making

This indicates that extension work will be more impactful in dissemination of technology among the farmers if it is done collectively. For rapid dissemination KVK must work collaboratively with Public and Privet sector [Sarvesh Mohania, & Rajat Pandey (2024), South Asia Biotechnology Centre. (2022). Estache *et al.* (2014), Ponnusamy (2013), Ashraf *et al* (2009) ^[1], and Asian Development Bank. (2021)]^[10, 11, 6, 9, 1, 2].

Conclusion

The collaborative efforts of ADT's KVK Baramati in disseminating silage making technology have significantly impacted the farming community in Pune District. Through partnerships with various public and private organizations, KVK Baramati has successfully addressed the critical issue of forage

scarcity from March to July, which has historically affected livestock productivity and farmers' livelihoods. The training and demonstrations provided to over 16,000 farmers across 458 villages have not only improved their knowledge and skills in silage preparation but have also resulted in tangible benefits such as increased milk production, improved animal health, and reduced labor costs. The implementation of diverse silage preparation methods has made green fodder available year-round, ensuring that farmers can sustain their dairy operations even during lean periods.

Moreover, the Krushik-Live Demo Agricultural Expo has played a crucial role in empowering farmers by showcasing innovative technologies and encouraging collective farming initiatives. The data clearly illustrates the large-scale adoption of silage

technology, demonstrating the effectiveness of collaborative extension work.

In conclusion, the success of silage making technology in Pune District underscores the importance of collaboration between various stakeholders in agricultural extension. Continued efforts in this direction will be essential for enhancing the productivity and sustainability of dairy farming in the region, ultimately contributing to the economic well-being of farmers and the agricultural community as a whole.

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- b. Indian Council of Agriculture, New Delhi, for their guidance and support in advancing agricultural research and practices in the region.
- c. National Dairy Development Board (NDDB), Anand, Gujarat, for their contributions to enhancing dairy development and productivity, which have significantly impacted local communities.
- d. Agricultural Technology Management Agency (ATMA), Pune, Maharashtra, for their dedication to promoting innovative agricultural technologies and providing essential support to farmers.
- e. Maharashtra Agricultural Competitiveness Project (MACP), for organizing the 60 Fodder Production demonstration in collaboration with KVK Baramati, which has been instrumental in improving fodder availability and quality.
- f. Managing Director, Testy Byte Foundation, for their support and engagement in promoting agricultural advancements and enhancing food security.

Your commitment and collaboration have made a significant difference, and we look forward to continuing our work together for the betterment of agriculture and rural development.

References

1. Ashraf N, Giné X, Karlan D. Finding missing markets (and a disturbing epilogue): Evidence from an export crop adoption and marketing intervention in Kenya. *Am J Agric Econ.* 2009;91(4):973-990. doi:10.1111/j.1467-8276.2009.01319.x
2. Asian Development Bank. Exploring Public-Private Partnership in the Irrigation and Drainage Sector in India: A Scoping Study. 2021. Available from: <https://www.adb.org/news/adb-improve-irrigation-farmer-incomes-indias-madhya-pradesh>
3. Bilal AK, Adnan M, Rehman FU, Hasnain A, Usman M, Javed MS, *et al.* Role of Silage in Agriculture: A Review. *Green Rep.* 2021;2(4):9-12.
4. Chambers R. Participatory Rural Appraisal (PRA): Challenges, Potentials and Paradigm. In: *Participatory Rural Appraisal: A Handbook for Practitioners.* International Institute for Environment and Development (IIED); 1994.
5. Shinde D, Karanje SV, Jagdale Y, Jadhav R, Joshi M, Bhoite V, *et al.* Empowering farmers: The socio-economic impact of Krishi Vigyan Kendra's need based technological interventions. *Int J Res Agronomy.* 2024;SP-7(8):243-248.
6. Estache A, Saussier S. Public-Private Partnerships and

Efficiency: A Short Assessment. Impact of public private partnership in agriculture: A review. *Indian J Agric Sci.* 2014;83(8):803-808.

7. Gray B. Collaborating: Finding common ground for multiparty problems. San Francisco, CA: Jossey-Bass; 1989.
8. Lasker RD, Weiss ES, Miller R. Partnership synergy: A practical framework for studying and strengthening collaborative advantage. *Milbank Q.* 2001;79(2):179-205. doi:10.1111/1468-0009.00203
9. Ponnusamy K. Impact of public private partnership in agriculture: A review. *Indian J Agric Sci.* 2013;83(8):803-8.
10. Mohania S, Pandey R. Public-Private Partnerships in the Indian Agricultural Sector: A Potential Path to Transformation. *Eur Econ Lett.* 2024;14(1). ISSN 2323-5233.
11. South Asia Biotechnology Centre. Agricultural technology needs public private partnerships. 2022. Available from: <https://www.weforum.org/agenda/2022/01/how-to-harness-transformative-potential-public-private-partnerships/>