Leadership, Education, Personality: An Interdisciplinary Journal ISSN: 2524-6178
www.sibe.rpress.co.in, Vol. 17, Issue 12 December 2022, UGC CARE 1

Assessing the Impact of the White Revolution on the Dairy Sector in Rural Haryana

DR. BALWAN SINGH,
Associate Professor of Geography,
Government College, Hisar

Abstract

Revolutions drive systematic transformations and restructuring of rural economies, society, and governments, thereby significantly influencing rural development and transforming socio-economic and political events. The White Revolution, initiated in India in the 1970s, significantly transformed the dairy sector in rural areas of Haryana. This study investigates the multifaceted impacts of the White Revolution on the dairy industry in rural Haryana, focusing on economic, social, and nutritional aspects. Data is collected through secondary sources. The findings reveal that the White Revolution facilitated increased milk production and enhanced the income of dairy farmers through the establishment of cooperative societies and improved access to markets. Additionally, it contributed to socio-economic empowerment, especially among women involved in dairy farming. However, challenges such as fluctuating milk prices, dependence on cooperative structures, and environmental sustainability must be addressed to sustain long-term growth. The study underscores the significance of continued government support and innovative practices to further enhance the resilience and profitability of the dairy sector in rural Haryana. This study contributes to understanding the transformative effects of agricultural policies on rural economies and suggests pathways for future development in the dairy industry.

Keywords: White Revolution, dairy sector, Rural Employment, economic impact, social empowerment, cooperative societies.

Introduction

Revolutions have traditionally served as tools for massive societal transformations, affecting economies, reshaping social structures, and redefining governing systems. These revolutions have had a significant impact on development in rural areas, particularly agricultural hubs like Haryana. Haryana, noted for its lush soil and agricultural prowess, has seen several revolutions, including the Green Revolution, technical developments, and sociopolitical upheavals. These improvements have changed rural lives, improved infrastructure, and redefined socioeconomic structures. The Green Revolution of the 1960s marked a watershed moment, establishing Haryana as a key contributor to India's food security by increasing agricultural output. However, this improvement was accompanied by issues such as groundwater depletion, land deterioration, and economic inequality. Beyond agriculture, technological and industrial revolutions have introduced modern infrastructure, digital connectivity and diversified rural economies. Similarly, socio-political movements have empowered rural communities, fostering social awareness, education and policy advocacy.

The White Revolution, spearheaded by Operation Flood, focused on boosting milk production in Haryana. This revolution promoted dairy farming by introducing better breeds of cattle,

providing veterinary care, and organizing rural farmers into cooperative societies. Haryana emerged as a significant contributor to India's dairy industry, with a marked increase in per capita milk availability. The revolution also empowered rural households, particularly women, by providing them with a stable source of income through dairy activities. This transformation strengthened rural livelihoods and added resilience to the agrarian economy,

The study emphasizes the need of sustained government assistance and creative techniques in improving the resilience and profitability of the dairy business in rural Haryana. It also highlights that how white revolution has influenced Haryana's rural landscape in different aspects. In order to combine progress with sustainability and guarantee long-term benefits for rural Haryana, policymakers, stakeholders, and communities must have a thorough understanding of the relationship between white revolution and rural development of Haryana.

Objectives of the Study

- To examine the growth of the dairy sector in rural Haryana after the White Revolution.
- To analyse the impact of the White Revolution on milk production and productivity.
- To assess the role of dairy cooperatives in rural employment and income generation.
- To identify major challenges faced by the dairy sector in rural Haryana.

Database and Methodology

The study is based entirely on secondary data. Data have been collected from the Census of India, Livestock Census, Department of Animal Husbandry and Dairying (Haryana), Registrar of Cooperative Societies, and published research articles, reports, and government publications. Simple statistical techniques such as percentages, growth trends, and tabular analysis have been used to interpret the data.

White revolution in Haryana

Haryana state was traditionally an agrarian region with crops with share of 93%, livestock with 4%, commercial forestry and fisheries with 2% each before its birth. But Haryana has witnessed transformative revolutions across agriculture, dairy and technology, significantly shaping its socio-economic landscape. The Green Revolution, introduced in the 1960s, revolutionized agriculture by incorporating high-yield variety seeds, advanced irrigation methods and mechanized farming techniques. With its fertile lands and adequate water resources, Haryana became a pivotal contributor to India’s agricultural growth, addressing food shortages and boosting rural livelihoods. Similarly, the White Revolution, spearheaded by Operation Flood, transformed Haryana into a key player in India's dairy industry. By improving cattle rearing practices and milk processing techniques, the state contributed substantially to making India self-sufficient in dairy production.

Before the Green Revolution, Haryana's agricultural productivity was hampered by traditional practices and erratic monsoons. Economic disparities between rural and urban areas, coupled with rising population pressure, intensified the demand for food, employment and better infrastructure. Furthermore, to remain globally competitive and achieve sustainable growth, Haryana needed innovative solutions in agriculture, dairy and technology, ultimately paving the way for these transformative changes.

The rural population of Haryana 165.09 lakhs lives in 7356 village of the state. It is 65.12% of total population. The percentage share of total workers to total population of Haryana decreased from 39.6 in 2001 to 35.2 in 2011. This highlights the predominantly rural character of the state. Furthermore, the Census 2011 identified 7356 rural settlements within the Haryana reflecting the dispersed and widespread nature of rural habitation in this area.

Majority of the population resides in rural areas and is dependent on the employment generated through the primary sector. Revolutions have acted as transformative agents, catalyzing profound changes in rural Haryana. The state, primarily agrarian, faced significant challenges in the mid-20th century, including low agricultural productivity, economic disparities and population pressures. These issues necessitated the adoption of revolutionary practices to sustain growth, enhance livelihoods and align with global advancements. The Green Revolution brought about an agricultural overhaul by introducing high-yield seeds, mechanization and advanced irrigation, which dramatically improved crop productivity and farmer incomes.

Impacts of White Revolution on dairy sector

In 2017-18, the rural population of Haryana remained the backbone of the state's dairy sector, contributing extensively to its high milk production and per capita availability. Strategic government interventions, coupled with rural dedication and the prominence of indigenous breeds like Murrah buffaloes, helped Haryana maintain its status as a leading milk producer in India. The White Revolution revolutionized the dairy sector, boosting milk production and providing diversified livelihoods, particularly for women through cooperatives and self-help groups. According to census 2011, about 45% worker (Cultivators and agricultural laborers) out of total working Population are engaged in agriculture and related activities. Out of this working population, 56% are directly engaged in dairy farming and associated activities. Animal husbandry and dairying (56 %) or agricultural operations (36 %) are the primary occupations of the majority of farmers. Furthermore, if animal husbandry is not their major occupation, then nearly two-thirds of the farmers (65%) engage in it as a supplementary occupation. These farmers typically have at least 20 years of expertise in dairying and farming. Every household has around one and a half family members involved in dairying. Sheep and goat rearing (0.8 members/household) and

Population	1997	2003	2007	2012
Total Bovines	7223576	7575019	7505589	7893428
Exotic/Crossbred Milch cows	259558	262506	267812	485603
Indigenous Milch Cows	431286	309256	339746	269004
Milch Buffalo	2040173	2725286	2704048	2765259

Table 1: No. of Milch animals in Haryana (source: Livestock census -Department of Animal Husbandry, Dairying and Fisheries, Haryana)

farming (one family member/household) come next. Generally women are more likely to engage in activities associated to dairying, whereas men are more likely to work as casual laborers.
According to live-stock census, 2012, there are 7893428 total bovines in Haryana state out of which 3519866 are milch animals (except goats).

This huge population of milch animals has made Haryana as second milk producing state of India. Despite of only 1.4% of India's total land area, the state produced 9.76 million metric tons of milk in 2017–18 i.e. 5.56% of the nation's total milk output.
Haryana state produced 4873000 Metric Tons milk in 2001 which increased up to 9760000 Metric Tons milk in 2017-18.(Figure 1). As per Integrated Sample Survey Report of Animal Husbandry & Dairying Department (2017-18), share of rural areas is about 89 %. Thus the white revolution through dairy farming played an important role in economic development of rural population of Haryana and motivated the employment generation especially to poor population and female population of rural areas.
Total milk production increased significantly from 4873 ('000 MT) in 2001-02 to 9760 ('000 MT) in 2017-18. The rise in milk production aligns with both the increase in the number of in-milk bovines and the improvement in milk yield.

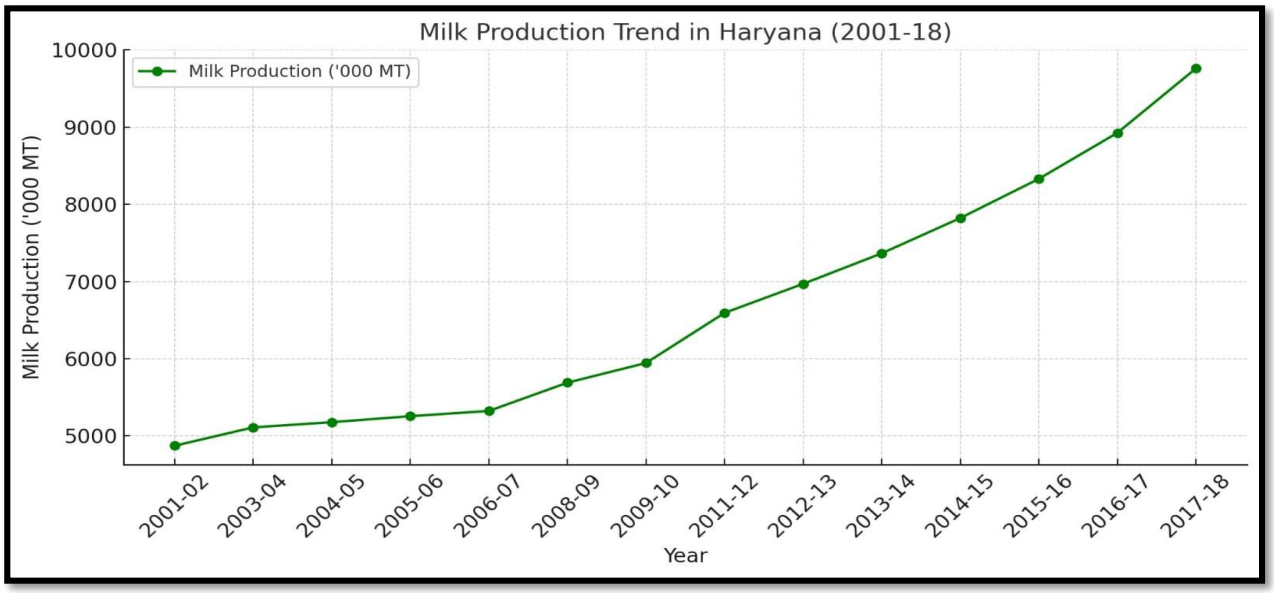

Figure 1: Milk production in Haryana (source: Department of Animal Husbandry, Dairying and Fisheries, Haryana

In these 17 years, milk production in Haryana is doubled. This is possible due to progress in diary sector in rural Haryana.
Cows, buffalo and goats (Indigenous/Crossbred) are major milch animals in Haryana. According to Table- 2, the number of in-milk bovines increased steadily over the years, starting at 2307 ('000) in 2001-02 and reaching 3135 ('000) by 2017-18. There were minor fluctuations (e.g., 2355 in 2005-06, slightly lower than previous years), but the overall trend is upward. This increase indicates better management and maintenance of livestock or growth in bovine population.

Year	In-milk Bovine ('000)	Milk Yield (kg/day)	Bovine Milk Production ('000 MT)
2001-02	2307	5.788	4873
2003-04	2381	5.882	5111
2004-05	2341	6.059	5178
2005-06	2355	6.114	5256
2006-07	2360	6.18	5324
2008-09	2471	6.31	5690
2009-10	2490	6.543	5945
2011-12	2576	7.014	6594
2012-13	2636	7.245	6970
2013-14	2710	7.445	7365
2014-15	2788	7.685	7822
2015-16	2844	8.025	8330
2016-17	2987	8.188	8926
2017-18	3135	8.534	9760

Table- 2: Production Performance of Milch Bovines in Haryana (Source: Department of Animal Husbandry, Dairying and Fisheries, Haryana)

Milk yield per animal increased consistently from 5.788 kg/day in 2001-02 to 8.534 kg/day in 2017-18 in Haryana state. The most significant improvement is observed in the later years, particularly from 2011-12 onward. This improvement is seen due to improved nutrition, healthcare, and breeding practices for dairy animals in rural area also.

The data reflects consistent development in Haryana's dairy industry, with improvement in herd size, productivity, and output. Growth in milk yield per animal highlights technological and management advancements, such as better feed quality and genetic improvements.

In order to facilitate the procurement of milk from different producers in the state, promote socio-economic development, and facilitate its processing into various products before marketing it through various unions throughout Haryana under the "Vita" brand, the Haryana Dairy Development Cooperative Federation Ltd was established in 1970. Approximately 330000 persons are directly engaged in the milk co-operative societies established under the supervision of this federation in 2017-18 (Table 3)

Year/District	No. of Societies	Members(Thousands)	Funds (in Lakh Rs.)
1966-67	148	3	4.26
1970-71	310	13	13.36
1975-76	1233	85	63.15
1980-81	1766	142	87.85

1990-91	2195	169	163.22
1995-96	2440	173	313.56
2000-01	2764	173	702.86
2005-06	4127	249	2258.89
2010-11	5500	290	713.73
2014-15	6090	322	2499.65
2015-16	6080	325.15	2772.58
2016-17	6249	331.83	2941.88
2017-18	6934	329.72	2598.05

Table 3 : Dairy and Milk Supply Co-operative Societies in Haryana (Source: Registrar Co- operative societies, Haryana

Total GDP of Haryana State was 60847100 lakh rupees in 2017-18. The Dairy and Milk Supply Co-operative Societies of Haryana had a total working capital of 1751.64 lakhs Rupees. These societies had procured milk and milk products of 48609.19 lakh Rupees and sold milk and milk products 47674.73 lakh Rupees in the same year (Table 4). This shows major role of dairy sector in GDP of the state.

Year	Working capital (in Lakh)	Milk and milk products procured (in Lakh Rs.)	Milk and milk products sold (lakh Rs.)
1966-67	10.77	0.62	0.67
1970-71	45.69	36.49	35.98
1975-76	338.04	221.26	245.96
1980-81	311.15	242.93	253.62
1990-91	385.8	693.03	729.57
1995-96	548.54	1687.26	1568.04
2000-01	1350.31	15667.14	17099.3
2005-06	10954.22	51182.75	52407.12
2010-11	1048.36	52431.81	62601.58
2014-15	1537.45	45521.19	52317.1
2015-16	1686.87	42271.26	48090.57
2016-17	1763.71	48829.48	55094.18
2017-18	1751.64	48609.19	47674.73

Table 4: Dairy and Milk Supply Co-operative Societies in Haryana and their contribution in Economy of Haryana (Source: Registrar Co-operative societies, Haryana.)

Table-5 highlights the procurement of milk, number of milk plants, and milk chilling centers in Haryana from 2015-16 to 2017-18. Milk procurement rose from 1648 lakh liters in 2015-16 to2050.4 lakh liters in 2017-18, indicating a significant increase in dairy production and collection efficiency.

However, the number of milk plants remained constant at 6 across all three years. The capacity of milk plants increased from 6.45 lakh liters per day in 2015-16 and 2016-17 to 9.45 lakh liters per day in 2017-18, reflecting an expansion in processing infrastructure. The number of milk chilling centers stayed at 17 during the period.

Years	Milk Procurement (through)(lac liters)	Milk Plants		Milk Chilling Centers	
		Number	Capacity (lac liters) per day	Number	Capacity (lac liters) per day
2015-16	1648	6	6.45	17	3.20
2016-17	1647.16	6	6.45	17	3.30
2017-18	2050.4	6	9.45	17	3.20

Table 5: Procurement of Milk, Number of Milk Plants and Milk Chilling Centers in Haryana (Source: Haryana Dairy Development Corporation)

The main programs and schemes for dairy development in Haryana are state and center sponsored. The schemes run by state Government are Assistance to States for Control of animal disease, National Project on Rinderpest Surveillance & Monitoring ,Professional Efficiency Development ,National Animal Disease Reporting System ,Establishment of Hi-Tech & Mini Dairy Units, Scheme for Integrated Murrah Development, Scheme for Providing Employment Opportunities to Scheduled Castes, Special Livestock Insurance Scheme, Gausamvardhan. The schemes run by central government are Sub-Mission on Livestock Development, Integrated Sample Survey, National Programme for Bovine Breeding and National Programme for Dairy Development. These schemes are promoting the dairy farming and generating thousands of employment.

Thus rural population in Haryana played a crucial role in milk production, as the state continued to be one of India's top contributors to the dairy sector. Rural areas accounted for the majority of this production, with a significant portion coming from small and marginal farmers.

Here are some detailed insights into their participation: --

Per Capita Availability:

Haryana's per capita milk availability during 2017-18 was around 1,080 grams per day, one of the highest in the country. This high availability was largely due to contributions from rural households engaged in dairy farming.

Livestock Ownership:

Rural households in Haryana primarily owned buffaloes, especially the high-yielding Murrah breed, which is native to the region and renowned for its superior milk production capabilities. Cows, including indigenous and crossbred varieties, also contributed significantly to milk production.

Role of Women:

Women in rural Haryana were heavily involved in dairy farming, participatingin activities such as

feeding, cleaning, milking, and managing livestock. Their role was critical in maintaining and enhancing milk production.

Cooperative Societies and Market Linkages:

The Haryana Dairy Development Cooperative Federation (HDDCF) actively engaged rural farmers by facilitating milk collection, ensuring fair prices, and providing a stable market through cooperative societies. Cooperative initiatives helped small-scale farmers improve their earnings and participate in organized dairy markets.

Government Initiatives:

Schemes such as the Rashtriya Gokul Mission and support from the National Dairy Development Board (NDDB) boosted milk production by improving veterinary services, genetic quality of livestock, and fodder availability. Subsidies and training programs were provided to rural farmers to encourage modern dairy practices.

Economic Contribution:

The dairy sector was a vital source of livelihood for rural households, with milk production contributing significantly to the state's Gross State Domestic Product (GSDP) in the agriculture sector. Many rural families relied on milk production as a steady income source, supplementing agricultural earnings.

Cultural Practices:

Dairy farming continued to be a deeply ingrained tradition in rural Haryana, with both traditional knowledge and modern practices contributing to efficient milk production.

However, Dairying sector in Haryana is facing many challenges related to market management and other facilities which are not provided to rural stake holders. Rural dairy farmers faced challenges like fluctuating milk prices, inadequate cold storage facilities, and limited access to advanced veterinary services. Feed costs and fodder scarcity during certain seasons also affected milk production

Although in the digital age, the Digital Revolution bridged the urban-rural divide by introducing e-governance, online marketplaces and educational platforms, empowering rural communities. All revolutions including white revolution collectively spurred significant rural development. Agricultural productivity soared, health of rural population improved, rural infrastructure such as roads and irrigation networks expanded and rural youth gained access to new education and

employment opportunities. The digital era, in particular, has enabled direct market access for farmers, enhancing economic empowerment and reducing dependency on middlemen. Despite these achievements, challenges such as environmental degradation from the Green Revolution, inequality in access to benefits and a persistent digital divide underscore the need for more inclusive and sustainable strategies. By addressing these challenges, Haryana can ensure that white revolution continue to drive equitable and holistic rural development.

Conclusion

The White Revolution has had a profound impact on the economic and social growth of rural Haryana, particularly in the dairy industry. The revolution increased milk output by bringing improved cow breeds, structured dairy cooperatives, and scientific methods, which made Haryana a major participant in India's dairy sector. By supplying steady revenue streams, this expansion not only enhanced rural lives but also gave excluded groups—especially women—more power, promoting social participation and financial independence. Despite these successes, obstacles to equitable growth still exist, including poor infrastructure, growing input prices, and restricted access to contemporary technologies. Focusing on bolstering rural dairy infrastructure, encouraging sustainable practices, and guaranteeing more inclusion through targeted regulations and assistance for small-scale farmers are essential if we are to maintain the benefits of the White Revolution. To sum up, the White Revolution has established a strong dairy economy in rural Haryana, but resolving its issues is essential to attaining socioeconomic goals of rural development, long-term growth, and rural prosperity.

References:

- Aggarwal, A., & Kumar, R. (2015). Economic impact of dairy cooperatives on rural development: A case study of Haryana. *Journal of Dairy Science, 98*(5), 2987–2995.
- Bharti, V., & Sharma, R. (2020). Gender roles in the dairy sector: Women empowerment through cooperative movements in Haryana. *Indian Journal of Agricultural Economics, 75*(3), 469–482.
- Chaudhary, D., & Kaur, N. (2017). Nutritional benefits of milk: A study on consumer preferences in Haryana. *Nutrition Journal, 16*(1), Article 63.
- Government of India, Ministry of Animal Husbandry, Dairying, and Fisheries. (2019). *Annual report on the dairy sector: Achievements and challenges*. Government of India.
- Joshi, P. K., & Kumar, A. (2021). Sustainability in dairy farming: Lessons from the White Revolution. *Sustainable Agriculture Reviews, 36*, 25–48.
- Maan, A., & Singh, J. (2018). The role of technology in enhancing dairy production in Haryana: An empirical analysis. *Indian Journal of Dairy Science, 71*(4), 332–340.
- Meena, R. L., & Chauhan, P. (2008). Rural infrastructure and its role in economic development: A case study of Haryana. *Journal of Rural Infrastructure Development, 14*(4), 205–217.
- Nanda, R., & Gupta, S. (2019). The impact of cooperative dairy models on rural economy in Haryana. *International Journal of Rural Management, 15*(2), 161–177.
- Ranjan, A., & Sharma, S. (2020). Milk prices and their effect on livestock farmers' income in rural Haryana: Insights from the White Revolution. *Agricultural Economics Research Review, 33*(2), 123–134.

- Sharma, R. (2022). Historical perspective of the White Revolution and its future in India. *Agriculture and Food Security, 11*(1), Article 1.
- Singh, J., & Kaur, G. (2012). Agricultural diversification and its impact on rural employment in Haryana. *Journal of Agricultural Economics, 67*(3), 435–450.
- Verma, P., & Chaudhary, A. (2019). Assessing the contributions of dairy farming to rural livelihoods: Evidence from Haryana. *Journal of Agricultural Studies, 7*(4), 120–138.
- VITA India. (n.d.). *Village-based dairy development initiatives*. https://www.vitaindia.org.in/
- Department of Animal Husbandry and Dairying, Haryana. (n.d.). *Pashudhan Haryana portal*. https://pashudhanharyana.gov.in/
- Revenue and Consolidation Department, Haryana. (n.d.). *Government of Haryana official portal*. https://rcsharyana.gov.in/en-US/