

Evaluating Farmer Income Enhancement Through the Godhan Nyay Yojana: A Village-Level Study from Sarkhor, Baloda Bazar District, Chhattisgarh

Rakesh Kumar Ghritlahare^{1*}, Devendra Singh Porte²

Assistant Professor, Department of Rural Technology and Social Development,
Guru Ghasidas Vishwavidyalaya, Bilaspur, Koni, Chhattisgarh – 495009, India^{*1}

Assistant Professor, Department of Rural Technology and Social Development,
Guru Ghasidas Vishwavidyalaya, Bilaspur, Koni, Chhattisgarh – 495009, India²

*Corresponding Author

Abstract: Rural communities in Chhattisgarh, India, have historically depended on agriculture and allied livestock activities for sustenance, yet persistent income insufficiency, inadequate infrastructure, and structural unemployment have kept millions below the poverty threshold. Against this backdrop, the Chhattisgarh state government launched the Godhan Nyay Yojana (GNY) on 20 July 2020 — a pioneering welfare programme that procures bovine dung from cattle keepers at a government-fixed price of ₹2 per kilogram and converts it into vermicompost through Women Self-Help Groups (WSHGs). The present study examines the tangible income benefits accruing to a selected cohort of 91 registered farming beneficiaries in Sarkhor village, Baloda Bazar–Bhatapara district. Using structured field interviews and primary data collected from Gothan records, the research documents a cumulative cow-dung procurement volume of 92,849.76 kg and a total disbursement of ₹1,85,699.52 across 32 active cow-dung vendors. The findings confirm that the programme has (a) generated a meaningful supplementary income stream for smallholder and marginal farmers, (b) curtailed open grazing and associated road hazards, (c) empowered rural women through participatory production roles, and (d) fostered a shift from synthetic to organic fertilisation. The study concludes that the GNY model offers a replicable framework for holistic rural livelihood enhancement with strong scalability potential.

Keywords: Godhan Nyay Yojana, bovine-dung procurement, vermicompost, Women Self-Help Groups, rural income, Chhattisgarh.

I. INTRODUCTION

India's development trajectory has long been shaped by the structural divide between its urban and rural geographies. According to the Census of India (2011), approximately 83.3 crore persons — nearly 69 per cent of the national population — reside in villages. These communities are characterised by multi-dimensional deprivation: low per-capita income, constrained literacy, chronic underemployment, and substandard nutritional and healthcare outcomes. Targeted rural development programmes have therefore constituted a central pillar of state and central governance for several decades.

Chhattisgarh, a predominantly agrarian state with roughly 80 per cent of its residents in rural settings, provides a representative context for studying such interventions. Various central and state-sponsored schemes aimed at socio-economic transformation of village economies have been operationalised here, each contributing to an evolving matrix of rural welfare delivery. Among these, the Godhan Nyay Yojana stands out as a structurally innovative initiative that directly monetises an otherwise untapped agricultural by-product — bovine dung — creating a circular economy at the village level.

Inaugurated on 20 July 2020 during the Hareli festival — Chhattisgarh's inaugural agricultural celebration — GNY was conceived under the leadership of Chief Minister Bhupesh Baghel. The programme institutionalises the purchase of cow dung from livestock holders at ₹2 per kilogram, channelling this input to Women Self-Help Groups who process it into vermicompost for onward sale at ₹8 (subsequently revised to ₹10) per kilogram through cooperative channels. The dual

objective is unambiguous: augmenting the earnings of the rural poor while simultaneously promoting ecologically sustainable organic farming practices. The scheme is implemented through Gauthans (village-level cowsheds) constructed under the complementary Surajji Gaon Yojana. As of its launch, over 2,200 cowsheds had been built across Chhattisgarh, with a statewide expansion envisioned to cover all 11,630 gram panchayats and 20,000 villages in a phased manner. The present paper offers a micro-level analysis of GNY implementation in Sarkhor village, Baloda Bazar district, examining its socio-economic implications for a sample of 91 registered beneficiaries.

Programme Rationale and Policy Context

The national aspiration to double farmers' income by 2022 — articulated at the highest levels of central government — necessitated complementary state-level interventions capable of addressing the structural fragility of agrarian livelihoods. With India's livestock population numbering 535.78 million (20th Livestock Census, 2019, Ministry of Fisheries, Animal Husbandry and Dairying), of which Chhattisgarh alone accounts for approximately 1.27 crore animals (64 per cent cattle), the productive potential of bovine dung as an income-generating asset had been chronically underutilised. At global scale, India holds nearly 31 per cent of the world's bovine population, underscoring the transformative implications of a nationally replicated dung-procurement model.

Concurrently, rising agrarian distress — manifested in mounting farmer suicides attributable to debt and low farm-gate prices — underscored the urgency of diversified rural income sources. The agriculture sector, while employing over 50 per cent of the national workforce, contributes barely 18 per cent to GDP, and a declining younger generation willing to remain in farming signals a long-term structural crisis. Schemes such as GNY, which supplement crop income with livestock-linked earnings and simultaneously address ecological degradation through reduced chemical fertilizer dependence, therefore constitute both an immediate welfare measure and a long-term sustainability intervention.

Objectives

1. To analyze the socio-economic profile of the beneficiary farmers participating in the Godhan Nyay Yojana in Sarkhor village.
2. To assess the quantum of income generated by the beneficiaries through the sale of cow dung (*gobar*) and organic fertilizers (vermicompost) under the scheme.
3. To evaluate the shift in household income and expenditure patterns of the farmers before and after the implementation of the scheme.
4. To examine the utilization of additional income earned from the scheme (e.g., investment in agriculture, education, health, or debt repayment).
5. To identify the major operational challenges and constraints faced by the farmers in the village regarding cow dung collection, payment mechanisms, and *Gauthan* (cattle shed) management.
6. To assess the perception and satisfaction levels of the local farming community towards the overall implementation and sustainability of the Godhan Nyay Yojana.

II. REVIEW OF LITERATURE

The imperative of rural transformation has occupied a central position in the development policy discourse of India and comparable agrarian economies. Mathur (2007) emphasised that rural development must be understood as a composite process targeting productivity improvement in economically marginalised village communities while simultaneously dismantling structural barriers to growth. The twin goals of poverty reduction and quality-of-life enhancement — through convergent delivery of health, education, and livelihood programmes — represent the normative foundations of state intervention in rural areas.

Thippaiah and Devendra Babu (1986) drew attention to systemic implementation failures in early rural credit and self-employment schemes, noting that misidentification of beneficiaries, inadequate trained manpower, loan misappropriation, and infrastructural deficits undermined programme efficacy. Rao and Natarajan (1988) similarly identified funding irregularities and weak supervision as persistent bottlenecks in the Integrated Rural Development Programme (IRDP), depriving intended beneficiaries of transformative economic support. Guhan (1986) highlighted governance challenges including corruption among programme administrators, which diverted benefits away from the rural poor.

The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) has been extensively studied as a flagship rural welfare instrument. Dreze (2007) examined systemic corruption in rural employment schemes in Odisha, observing that rent-seeking behaviour endemic to earlier programmes persisted in MGNREGA operations. Ambasta, Shankar, and Shah (2008) recommended the deployment of dedicated full-time professionals at block level and a

sustained nationwide capacity-building campaign at gram panchayat level to improve programme delivery. Khera (2008) demonstrated that community ownership and active civic engagement — as observed in Pati block, Odisha — were decisive determinants of MGNREGA success, enabling residents to translate their statutory rights into material gains.

Mehrotra (2008) argued from an administrative perspective that the four per cent administrative cost ceiling under MGNREGA was insufficient for a programme of such magnitude, citing inadequate professional support as a binding constraint on implementation quality. Mathur (2009) documented social audit findings from Andhra Pradesh that revealed discrepancies between job cards and actual payment records, pointing to data integrity and transparency failures. Dey and Bedi (2010) underscored that genuine people's participation — procedurally and philosophically — is the cornerstone of effective rural development, a conclusion that resonates with the WSHG-centred design of the Godhan Nyay Yojana. Roy and Samanta (2010) demonstrated through a case study of West Bengal gram panchayats that NREGA, when coupled with good governance practices, could meaningfully enhance employment and welfare outcomes for rural households. Ramesh (2012) articulated a broader vision of rural development as a path toward sustainable quality-of-life improvement for the rural poor, a framing that implicitly encompasses newer livestock-linked schemes like GNY. Arup (2013) explored indirect consequences of rural policy interventions — including the impact of land acquisition and displacement on educational outcomes — reminding scholars that the ripple effects of welfare programmes extend beyond their immediate objectives.

Lalith (2004) documented the evolving institutional architecture of India's rural development apparatus, tracing its transformation from the Community Projects Administration (established March 1952) through successive ministerial reorganisations culminating in the Ministry of Rural Development as constituted post-1991. The progressive devolution of authority to Panchayati Raj Institutions — catalysed by the 73rd Constitutional Amendment Act of 1992 — expanded the scope for community-driven implementation, creating an enabling environment for schemes like GNY, which rely on gram panchayat-level Gothan committees for operational delivery. The review of existing literature thus reveals a clear lineage of policy learning: from top-down, credit-driven approaches of the 1970s–1980s, through participatory employment guarantee schemes, to the present generation of community-managed, SHG-anchored livelihood programmes.

III. MATERIAL AND METHODS

Study Area

The present investigation was conducted in Sarkhor village, situated within Baloda Bazar tehsil of Baloda Bazar–Bhatapara district, Chhattisgarh. The village lies approximately 26 km from the district headquarters at Baloda Bazar and 110 km from the state capital, Raipur. Sarkhor serves as a gram panchayat headquarters and maintains its own post office (PIN: 493526). As per Census 2011, the total geographic extent of the village is 1,290.76 hectares, with a resident population of 4,700 persons (2,352 males; 2,348 females) distributed across approximately 850 households. Baloda Bazar town, the nearest urban centre, lies about 25 km away.

Sampling and Data Collection

The study employs a primary survey methodology. A structured questionnaire was developed to capture socio-economic indicators alongside GNY participation patterns. A purposive sample of 91 respondents — comprising registered farmers and scheme workers operating within the Sarkhor Gothan framework — was selected for in-depth personal interviews conducted at respondents' residences and workplaces. Questionnaire items were explained in the local dialect by the investigator, and responses were recorded manually for subsequent transcription and analysis. Supplementary data were drawn from Gothan committee transaction records to corroborate self-reported income figures.

Analytical Approach

The analysis proceeds descriptively, documenting individual-level cow-dung procurement volumes, payment disbursements, and WSHG vermicompost production activities. Cross-tabulations disaggregated by gender and social category are presented to examine differential participation and benefit patterns. The primary focus is on quantifying the income increment attributable to GNY participation for the sampled households.

IV. RESULTS AND DISCUSSION

Socio-Economic Profile of Beneficiaries

The survey population exhibits the characteristic composition of a mid-sized Chhattisgarhi village: a majority of households belong to the Other Backward Classes (OBC) category, with scheduled caste (SC) and scheduled tribe (ST) households constituting significant minorities. Bovine dung collection has historically been an informal subsistence

activity in Sarkhor, with households generating modest quantities for personal use in cooking fuel and soil conditioning. GNY transformed this informal practice into a monetised transaction, providing cattle-keeping households — irrespective of landholding size — with a predictable non-farm income source. The study finds that awareness of and enrolment in GNY was notably high among women-headed or women-inclusive households, reflecting the scheme's design emphasis on female beneficiary participation.

Registered Beneficiary Roster

Table 1 presents the complete list of 91 farmers and community workers registered under GNY in Sarkhor village, along with their demographic details and bank account particulars through which scheme payments are disbursed via direct benefit transfer.

S.N.	Farmer Name	Sex	Category	Bank Account No.	IFSC Code
1	Bairagi	Male	OBC	624047083651	UTIB0JSBR01
2	Amrautin Bai	Female	OBC	43418100001177	BARB0BALBAZ
3	Malechh Ram	Male	OBC	624047115982	UTIB0JSBR01
4	Kaushal Prasad	Male	OBC	624047038993	UTIB0JSBR01
5	Devnarayan	Male	OBC	43418100005434	BARB0BALBAZ
6	Sukhmani Bai Manikpuri	Female	OBC	43418100004708	BARB0BALBAZ
7	Noni Bai	Female	OBC	624047013311	UTIB0JSBR01
8	Sumitri Bai Manikpuri	Female	OBC	37463670226	SBIN0018181
9	Java Bai Yadav	Female	OBC	36566991455	SBIN0018181
10	Raj Bai Yadav	Female	OBC	36958037446	SBIN0018181
11	Anita Bai Paikra	Female	ST	35705988148	SBIN0018181
12	Pramila Sahu	Female	OBC	43418100001357	BARB0BALBAZ
13	Savitri Bai Paikra	Female	ST	43418100006014	BARB0BALBAZ
14	Sukhmat Bai Patel	Female	OBC	43418100001159	BARB0BALBAZ
15	Sangam Bai Patel	Female	OBC	43418100004999	BARB0BALBAZ
16	Durpat Bai Patel	Female	OBC	43418100001343	BARB0BALBAZ
17	Ramakanti Sahu	Female	OBC	43418100005245	BARB0BALBAZ
18	Dhunja Bai Rajak	Female	OBC	43418100005121	BARB0BALBAZ
19	Bhagmati Bai Rajak	Female	OBC	43418100001113	BARB0BALBAZ
20	Sukwara Bai Paikra	Female	ST	43418100012041	BARB0BALBAZ
21	Sakunmati Patel	Female	OBC	43418100005356	BARB0BALBAZ
22	Geeta Bai Sahu	Female	OBC	43418100011062	BARB0BALBAZ
23	Urmila	Female	SC	32812139772	SBIN0018181
24	Lala Ram Patel	Male	OBC	624047013785	UTIB0JSBR01
25	Tuharu Patel	Male	OBC	624047088446	UTIB0JSBR01
26	Harprasad	Male	OBC	624047087033	UTIB0JSBR01



S.N.	Farmer Name	Sex	Category	Bank Account No.	IFSC Code
27	Ramlal	Male	OBC	624047146830	UTIB0JSBR01
28	Shayam lal	Male	OBC	624047013559	UTIB0JSBR01
29	Govind	Male	OBC	624047081053	UTIB0JSBR01
30	Sevti Bai Patel	Female	OBC	43418100005288	BARB0BALBAZ
31	Budhram Kathotre	Male	SC	124000085090	UTIB0JSBR01
32	Anita Sahu	Female	OBC	63051494092	SBIN0030438
33	Sukhnandan Sahu	Male	OBC	124003427487	UTIB0JSBR01
34	Dhaneshwar Sahu	Male	OBC	624047130614	UTIB0JSBR01
35	Susan Bai Sahu	Female	OBC	43418100005301	BARB0BALBAZ
36	Prahlad Sahu	Male	OBC	35136246340	SBIN0010829
37	Sammelal Sahu	Male	OBC	624047126563	UTIB0JSBR01
38	Gangaram Sahu	Male	OBC	624047157058	UTIB0JSBR01
39	Jagdish Sahu	Male	OBC	624047119817	UTIB0JSBR01
40	Glenda Bai Sahu	Female	OBC	20384758592	SBIN0018181
41	Manish Sahu	Male	OBC	35211897579	SBIN0018181
42	Mayaram Kurrey	Male	SC	624047135238	UTIB0JSBR01
43	Sukalu Banjare	Male	SC	624047162104	UTIB0JSBR01
44	Learn Kumar Dahariya		SC	124000018114	UTIB0JSBR01
45	Laxminarayan Kurrey	Male	SC	624047119839	UTIB0JSBR01
46	Munni Bai Paikara	Female	ST	43418100001213	BARB0BALBAZ
47	Nanki Bai Sahu	Female	OBC	43418100004695	BARB0BALBAZ
48	Narmada Bai Patel	Female	OBC	43418100005430	BARB0BALBAZ
49	Heera Bai Patel	Female	OBC	43418100004753	BARB0BALBAZ
50	Itwara Paikara	Female	ST	43418100005414	BARB0BALBAZ
51	Chameli Bai Sen	Female	OBC	43418100001320	BARB0BALBAZ
52	Shanti Bai Sahu	Female	OBC	43418100001551	BARB0BALBAZ
53	Narad Bai Patel	Female	OBC	43418100005683	BARB0BALBAZ
54	Kanshi Patel	Male	OBC	43418100005307	BARB0BALBAZ
55	Ajay Kumar Sahu	Male	OBC	35643940126	SBIN0018181
56	Harishankar Patel	Male	OBC	105710063152	BKDN0821057
57	Kamlesh Yadav	Male	OBC	105710063207	BKDN0821057
58	Panchram Sahu	Male	OBC	105710063166	BKDN0821057
59	Bhagvati Sahu	Female	OBC	105710063165	BKDN0821057

S.N.	Farmer Name	Sex	Category	Bank Account No.	IFSC Code
60	Ramavtar Paikara	Male	ST	624047135635	UTIB0JSBR01
61	Nutan Yadav	Male	OBC	124000031893	UTIB0JSBR01
62	Chandram Sahu	Male	OBC	624047005730	UTIB0JSBR01
63	Santosh Sahu	Male	OBC	624047168934	UTIB0JSBR01
64	Shiv Varma	Male	OBC	624047111705	UTIB0JSBR01
65	Anusuiya Bai Verma	Female	OBC	624047034104	UTIB0JSBR01
66	Chandaram Verma	Male	OBC	124002320192	UTIB0JSBR01
67	Dhananjay Verma	Male	OBC	124002361912	UTIB0JSBR01
68	Rampyari Verma	Female	OBC	20427056813	SBIN0018181
69	Muktamani Verma	Female	OBC	20427056824	SBIN0018181
70	Lalita Verma	Female	OBC	35140203579	SBIN0010829
71	Raghunath Paikara	Male	ST	624047052985	UTIB0JSBR01
72	Ramgopal Paikara	Male	ST	624047027437	UTIB0JSBR01
73	Shyamsunder Sahu	Male	OBC	624047115223	UTIB0JSBR01
74	Bachcharam Sahu	Male	OBC	105710063178	BKDN0821057
75	Arti Kewat	Female	OBC	105710063111	BKDN0821057
76	Kamal Narayan	Male	OBC	105710063161	BKDN0821057
77	Deepak Kumar	Male	OBC	105710063162	BKDN0821057
78	Rooplal Kathotre	Male	SC	30533012869	SBIN0018181
79	Rohit Kumar Kewat	Male	OBC	105710063155	BKDN0821057
80	Shobharam Manhare	Male	SC	105710063185	BKDN0821057
81	Ramsay Sahu	Male	OBC	105710063215	BKDN0821057
82	Dhan Bai Sahu	Female	OBC	105710063145	BKDN0821057
83	Amrit Bai Yadav	Female	OBC	105710064140	BKDN0821057
84	Ramayan Yadav	Male	OBC	105710064191	BKDN0821057
85	Paranu Yadav	Male	OBC	36962268764	SBIN0018181
86	Sawitri Yadav	Female	OBC	34777327533	SBIN0001048
87	Gopal Das	Male	OBC	31844588194	SBIN0018181
88	Chhoti Bai Yadav	Female	OBC	36566991273	SBIN0018181
89	Jagmoutin	Female	OBC	34609616143	SBIN0010829
90	Ganeshi Bai	Female	OBC	43418100004768	BARB0BALBAZ
91	Budhwara Bai	Female	OBC	43418100004825	BARB0BALBAZ

Table 1: Complete Register of GNY Beneficiaries — Sarkhor Village, Baloda Bazar (Source: Gothan Committee Records, 2021–22)

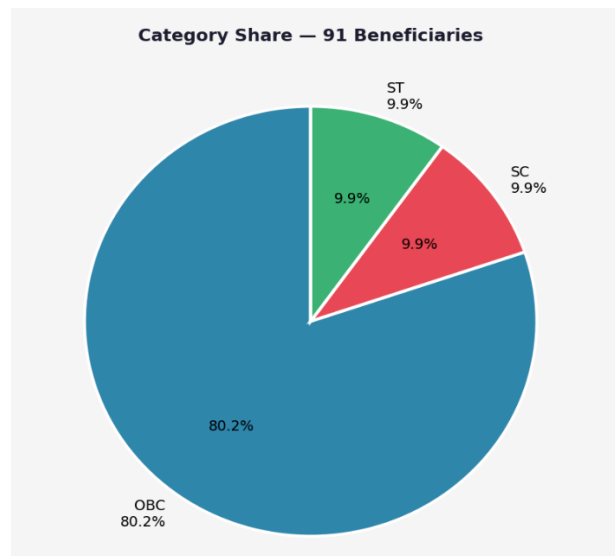


Figure 1: Cow-Dung Procurement Volumes by Vendor

Among the 91 registered beneficiaries, 32 individuals actively participated in cow-dung vending during the reference period. Table 2 documents individual procurement quantities. A marked concentration is evident: the top five vendors by volume — Chhoti Bai Yadav (19,738 kg), Savitri Bai Paikara (12,613 kg), Ganeshi Bai (11,448 kg), Paranu Yadav (10,476 kg), and Sawitri Yadav (9,645 kg) — collectively account for over 72 per cent of total procurement. This skewness likely reflects differences in herd size and household labor availability rather than scheme-level access barriers. Notably, women vendors contribute a disproportionately large share of total supply, underscoring the scheme's documented success in channeling female labor toward productive economic activities.

S.N.	Vendor Name	Sex	Cow Dung Qty. (kg)
1	Bairagi	Male	10.45
2	Sukhmani Bai Manikpuri	Female	5,685.10
3	Nonibai	Female	791.00
4	Sumitiri Bai Manikpuri	Female	506.15
5	Java Bai Yadav	Female	10.10
6	Raj Bai Yadav	Female	12.30
7	Anita Bai Paikara	Female	230.10
8	Pramila Sahu	Female	4,577.15
9	Savitri Bai Paikara	Female	12,613.11
10	Sukhmat Bai Patel	Female	15.50
11	Sangam Bai Patel	Female	18.10
12	Durpat Bai Patel	Female	7.40
13	Ramakanti Sahu	Female	98.40
14	Dhunias Bai Rajak	Female	8.30
15	Bhagmati Bai Rajak	Female	10.70
16	Sukwara Bai Paikara	Female	6.30

S.N.	Vendor Name	Sex	Cow Dung Qty. (kg)
17	Sakunmati Patel	Female	511.40
18	Amroutin Bai	Female	5.20
19	Geeta Bai Sahu	Female	3,137.00
20	Malechh Ram	Male	501.00
21	Urmila	Female	200.00
22	Kaushal Prasad	Male	500.00
23	Devnarayan	Male	1,943.00
24	Heera Bai Patel	Female	1,421.00
25	Kanshi Patel	Male	96.00
26	Paranu Yadav	Male	10,476.00
27	Sawitri Yadav	Female	9,645.00
28	Gopal Das	Male	466.00
29	Chhoti Bai Yadav	Female	19,738.00
30	Jagmoutin	Female	4,310.00
31	Ganeshi Bai	Female	11,448.00
32	Budhwara Bai	Female	3,852.00
Total			92,849.76 kg

Table 2: Cow-Dung Procurement Volumes by Vendor — Sarkhor Gothan (Source: Gothan Committee Transaction Records)

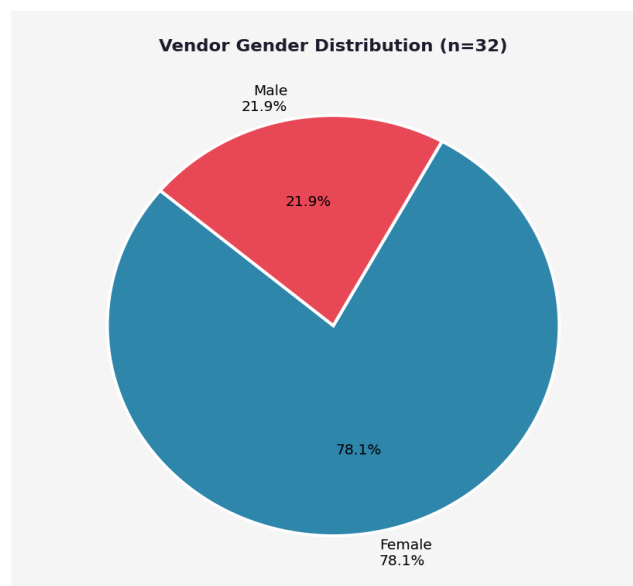


Figure 2: Financial Disbursements

Table 3 maps procurement volumes to actual payments, calculated at the statutory rate of ₹2 per kilogram. The aggregate procurement across 32 vendors totalled 92,849.76 kg, generating a cumulative disbursement of ₹1,85,699.52 — a substantial injection of cash income into Sarkhor's rural economy. The largest individual beneficiary, Chhoti Bai Yadav,

received ₹39,476, while even smaller-scale vendors such as Bairagi (₹20.90) and Amroutin Bai (₹10.40) received payments, demonstrating the scheme's reach across the participation spectrum. The data confirm that payments were disbursed directly to beneficiaries' bank accounts within a 15-day settlement window as stipulated under GNY guidelines.

S.N.	Vendor Name	Cow Dung Qty. (kg)	Amount Paid (₹)
1	Bairagi	10.45	20.90
2	Sukhmani Bai Manikpuri	5,685.10	11,370.20
3	Nonibai	791.00	1,582.00
4	Sumitiri Bai Manikpuri	506.15	1,012.30
5	Java Bai Yadav	10.10	20.20
6	Raj Bai Yadav	12.30	24.60
7	Anita Bai Paikara	230.10	460.20
8	Pramila Sahu	4,577.15	9,154.30
9	Savitri Bai Paikara	12,613.11	25,226.22
10	Sukhmat Bai Patel	15.50	31.00
11	Sangam Bai Patel	18.10	36.20
12	Durpat Bai Patel	7.40	14.80
13	Ramakanti Sahu	98.40	196.80
14	Dhuniba Bai Rajak	8.30	16.60
15	Bhagmati Bai Rajak	10.70	21.40
16	Sukwara Bai Paikara	6.30	12.60
17	Sakunmati Patel	511.40	1,022.80
18	Amroutin Bai	5.20	10.40
19	Geeta Bai Sahu	3,137.00	6,274.00
20	Malechh Ram	501.00	1,002.00
21	Urmila	200.00	400.00
22	Kaushal Prasad	500.00	1,000.00
23	Devnarayan	1,943.00	3,889.00
24	Heera Bai Patel	1,421.00	2,842.00
25	Kanshi Patel	96.00	192.00
26	Paranu Yadav	10,476.00	20,952.00
27	Sawitri Yadav	9,645.00	19,290.00
28	Gopal Das	466.00	932.00
29	Chhoti Bai Yadav	19,738.00	39,476.00
30	Jagmoutin	4,310.00	8,620.00

S.N.	Vendor Name	Cow Dung Qty. (kg)	Amount Paid (₹)
31	Ganeshi Bai	11,448.00	22,896.00
32	Budhwara Bai	3,852.00	7,704.00
		92,849.76	1,85,699.52

Table 3: Cow-Dung Procurement Quantities and Corresponding Payments to Vendors (Rate: ₹2/kg)

Logistics and Transportation

Cow-dung vendors in Sarkhor transport their collected material to the village Gothan independently, typically over distances of one to two kilometres. The logistical burden is therefore modest and manageable for most households. This proximity is an important design feature, as it minimises transaction costs and makes participation viable even for small vendors with limited transport resources. Over time, vendor households have also acquired knowledge of vermicompost production techniques — shared through WSHG interactions — creating a pathway for backward integration into value-added processing.

Beyond income generation, the programme has catalyzed a complementary shift toward organic fertilization among participating and neighbouring farming families. The ready availability of low-cost vermicompost at the local Gothan has reduced dependence on commercially produced synthetic inputs, improving soil organic matter content and long-term land productivity.

Cow-Dung Collection and Storage at Gothan

At the Gothan facility, procured cow dung is systematically stored in a dedicated holding area before transfer to vermi tanks. The material undergoes a 15–20-day pre-composting phase to achieve partial decomposition, ensuring that it does not exert thermotoxic effects on earthworm populations once introduced into the vermi-beds. This controlled pre-processing distinguishes GNY's quality management approach from informal composting practices, and aligns with technical standards prescribed by NABARD and Krishi Vigyan Kendra advisories.

Vermi Tank Construction

Both permanent (brick masonry with shed) and semi-permanent vermi tanks have been erected at the Sarkhor Gothan under MGNREGA provisions administered through the Panchayat and Rural Development Department. Tank dimensions conform to the programme standard of 3.6 m × 1.5 m × 0.75 m. The structural design incorporates geographic and climatic considerations — including shade provision and drainage management — to ensure optimal moisture conditions and earthworm survival rates throughout the year. Urban Gothan facilities are constructed through the respective municipal bodies under the National Urban Livelihood Mission.

Women Self-Help Group: Gau Mata Mahila Swah Sahayata Samuh

The Gau Mata Mahila Swah Sahayata Samuh — a 12-member WSHG — holds exclusive operational responsibility for vermicompost production and packaging at the Sarkhor Gothan. Table 4 profiles the group's membership.

S.N.	Gothan	Samuh Name	Member Name	Age	Designation
1	Sarkhor	Gau Mata Mahila Swah Sahayata Samuh	Jayanti Manikpuri	36	President
2	Sarkhor	Gau Mata Mahila Swah Sahayata Samuh	Madhu Sahu	22	Secretary
3	Sarkhor	Gau Mata Mahila Swah Sahayata Samuh	Rajkumari Manikpuri	61	Member
4	Sarkhor	Gau Mata Mahila Swah Sahayata Samuh	Rupa Bai Manikpuri	29	Member
5	Sarkhor	Gau Mata Mahila Swah Sahayata Samuh	Sangam Bai	46	Member

S.N.	Gothan	Samuh Name	Member Name	Age	Designation
6	Sarkhor	Gau Mata Mahila Swah Sahayata Samuh	Rukhmat Bai Patel	34	Member
7	Sarkhor	Gau Mata Mahila Swah Sahayata Samuh	Savitri Bai	48	Member
8	Sarkhor	Gau Mata Mahila Swah Sahayata Samuh	Ramakanti Sahu	47	Member
9	Sarkhor	Gau Mata Mahila Swah Sahayata Samuh	Sakunmati Patel	40	Member
10	Sarkhor	Gau Mata Mahila Swah Sahayata Samuh	Sukwara Bai Paikara	49	Member
11	Sarkhor	Gau Mata Mahila Swah Sahayata Samuh	Durpat Bai Patel	41	Member
12	Sarkhor	Gau Mata Mahila Swah Sahayata Samuh	Anita Bai Paikara	41	Member

Table 4: Membership Profile — Gau Mata Mahila Swah Sahayata Samuh, Sarkhor

The group's age composition (22–61 years) and the leadership structure — with an elected president and secretary — reflect the self-governance norms promoted under the National Rural Livelihood Mission framework. Members received vermicompost production training through the Krishi Vigyan Kendra and the district's NRLM cell, equipping them with the technical and organisational competencies required for sustained programme participation. The WSHG model ensures that a significant portion of the scheme's value addition accrues to women, reinforcing gender-equitable outcomes. Vermicompost Manufacturing, Packaging, and Marketing

The production cycle commences with the transfer of pre-decomposed cow dung into vermi tanks, followed by seeding with earthworms. Over 45–60 days, the earthworm population transforms the organic substrate into vermicompost of standardised nutrient quality. Upon maturation, vermicompost is separated from earthworms using mesh screens, dried to appropriate moisture content, weighed, and packaged by WSHG members into polythene bags of 2 kg, 5 kg, and 30 kg sizes. Packaging carries product label information as per government specifications.

Pre-dispatch quality checks — including laboratory sample testing — ensure that the finished product meets applicable standards for organic fertilisers. Distribution is handled through the cooperative society network, precluding the need for competitive tendering by individual departments and ensuring predictable market access for Gothan-produced vermicompost. The initial sale price of ₹8 per kilogram has since been revised upward to ₹10, enhancing the financial viability of WSHG operations and broadening the reinvestment capacity of Gothan committees.

Analysis of the study: In this study the analysis is performed through SPSS version 27.

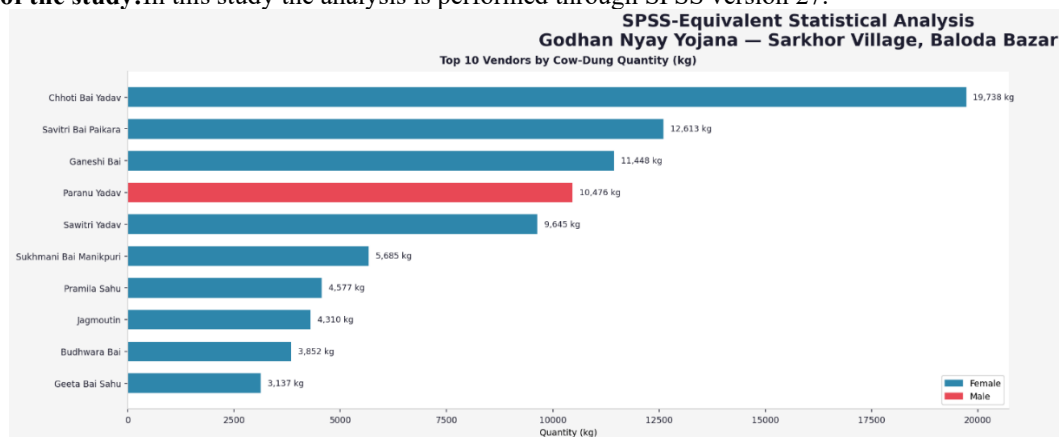


Figure 3: Equivalent Statistical Analysis

This horizontal bar chart ranks the top 10 vendors by total quantity of cow dung sold (in kg). In this chart Chhoti Bai Yadav is the top performer with 19,738 kg — far ahead of others, Savitri Bai Paikara is second with 12,613 kg, followed by Ganeshi Bai at 11,446 kg, Paranu Yadav (highlighted in red/pink) sold 10,476 kg — the only male vendor in the top 10, The remaining vendors (Savitri Yadav, Sukhmani Bai, Pramila Sahu, Jagmoutin, Budhwara Bai, Geeta Bai Sahu) range from 3,137 kg to 9,645 kg, Blue bars = Female vendors; Red/Pink bar = Male vendor, This shows that women dominate high-quantity selling in this scheme.

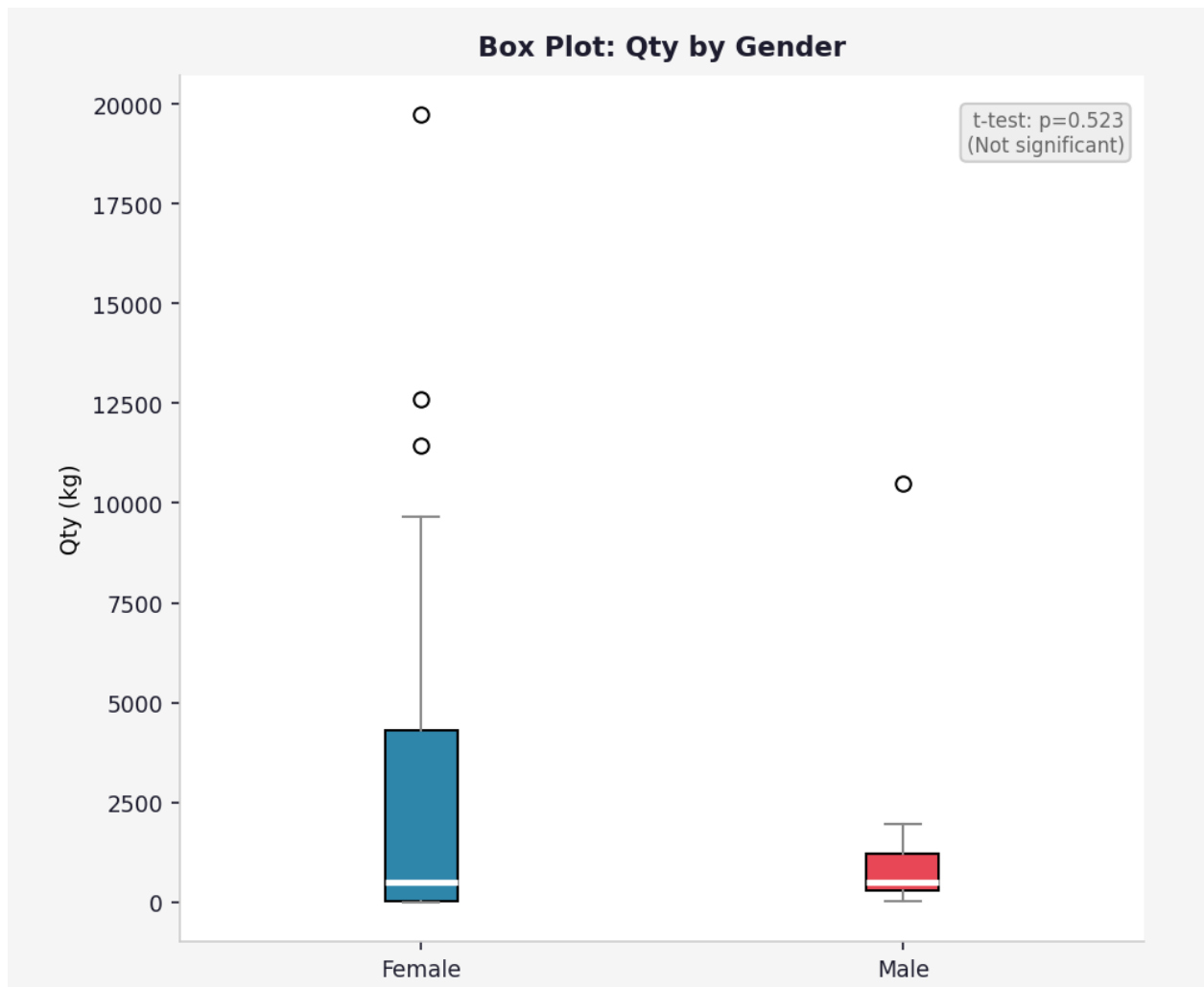


Figure 4: Box Plot

This box plot compares the distribution of cow dung quantities sold by Female vs. Male vendors. Female vendors show a much wider spread — the box (interquartile range) stretches from near 0 to ~4,200 kg, with a median around 500 kg. There are three outliers above 11,000 kg (including the top vendor at ~19,700 kg), Male vendors have a much tighter, smaller distribution — median around 800 kg, box between ~400–1,500 kg, with one outlier at ~10,400 kg. The t-test result ($p = 0.523$) is shown in the top-right corner, meaning there is no statistically significant difference between male and female quantities — despite females appearing to sell more on average, the variation is too high to be conclusive.

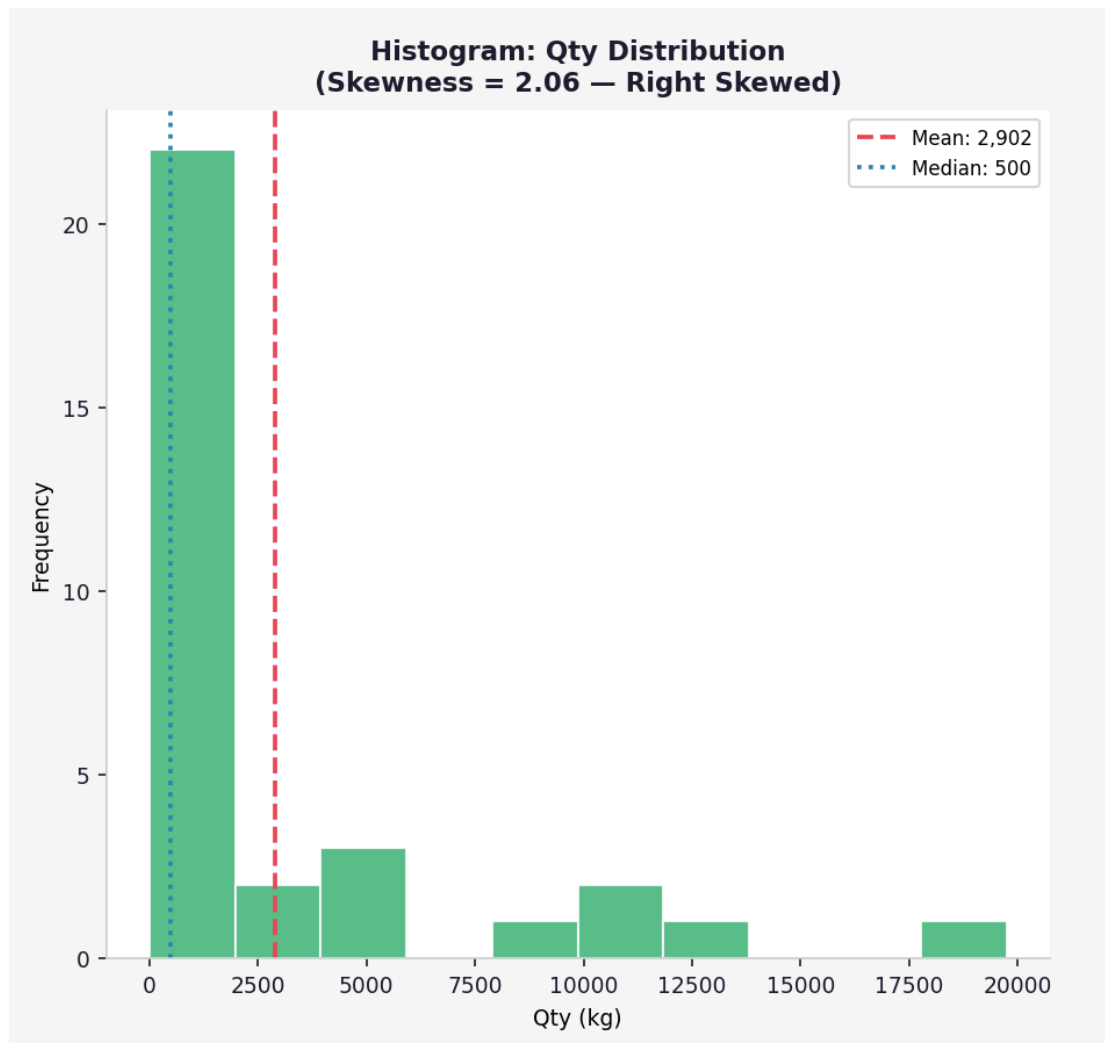


Figure 5: Box Plot

This histogram shows the frequency distribution of quantities sold across all vendors. The distribution is heavily right-skewed (Skewness = 2.06), meaning most vendors sell very little, but a few sell extremely large amounts, 22 vendors sold between 0–2,500 kg — the vast majority, only a handful sold between 2,500–6,000 kg (about 5 vendors total), A few vendors sold between 10,000–13,000 kg, and one sold close to 20,000 kg, The Mean (2,902 kg) is shown by the red dashed line — far to the right of the Median (500 kg), shown by the blue dotted line. This large gap confirms extreme skewness — a small number of high-volume vendors pull the average up dramatically.

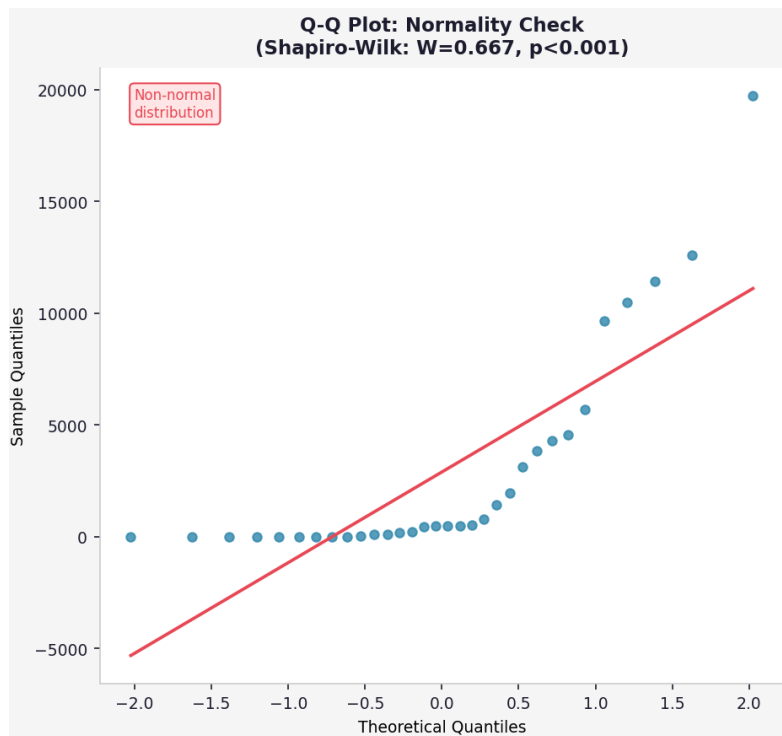


Figure 6: Q-Q Plot

This Quantile-Quantile (Q-Q) plot checks whether the quantity data follows a normal (bell-curve) distribution. If data were perfectly normal, all points would fall along the red diagonal line. Instead, the points curve sharply away from the line — especially at the upper end — indicating heavy right-skew. The Shapiro-Wilk test result ($W = 0.667$, $p < 0.001$) confirms this statistically: the data is significantly non-normal, the label "Non-normal distribution" is explicitly marked on the chart. This means standard parametric tests (like t-tests assuming normality) may be less reliable, and non-parametric alternatives should be considered.

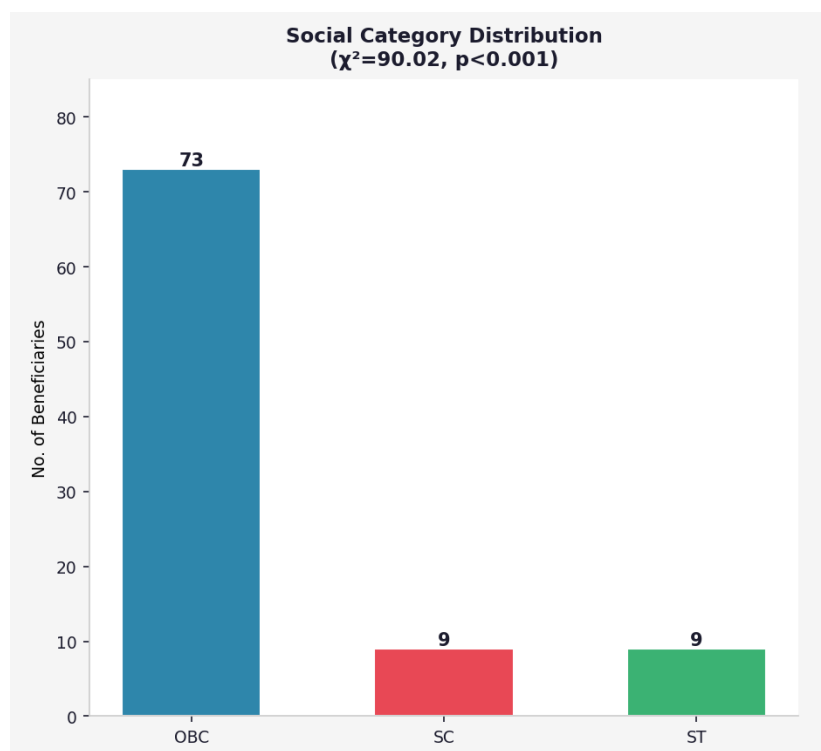


Figure 7: Bar Chart

This bar chart shows how beneficiaries are distributed across social/caste categories. OBC (Other Backward Classes): 73 beneficiaries — the overwhelming majority (~80%), SC (Scheduled Caste): 9 beneficiaries, ST (Scheduled Tribe): 9 beneficiaries. The Chi-square test ($\chi^2 = 90.02$, $p < 0.001$) shows this unequal distribution is highly statistically significant — OBC communities dominate participation in this scheme in this village, likely reflecting the local demographic composition.

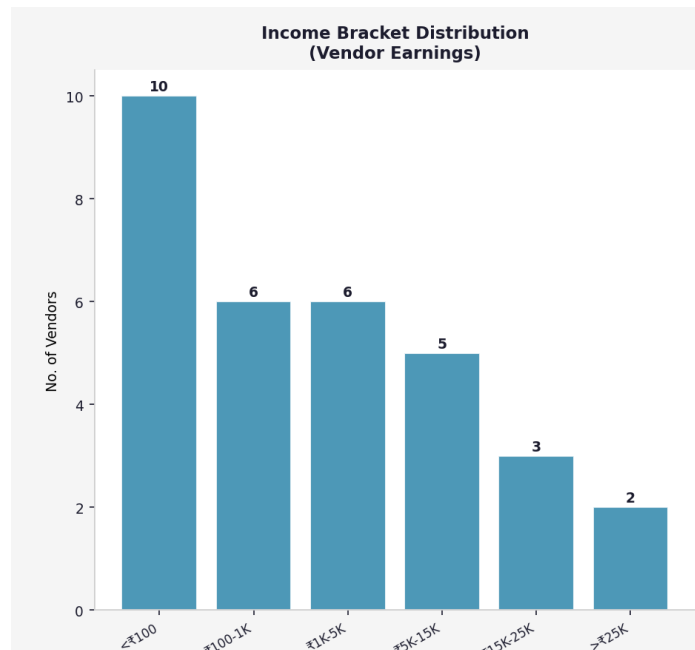


Figure 8: Vendor earnings distribution chart

This chart shows the earnings distribution of vendors from the scheme. 10 vendors earned less than ₹100 — the largest group, indicating many people earned very little, 6 vendors each earned in the ₹100–1K and ₹1K–5K ranges, 5 vendors earned ₹5K–15K, 3 vendors earned ₹15K–25K, 2 vendors earned more than ₹25K — the highest earners. This confirms a highly unequal income distribution — most vendors earn negligible amounts, while a small few earn substantial income from the scheme.

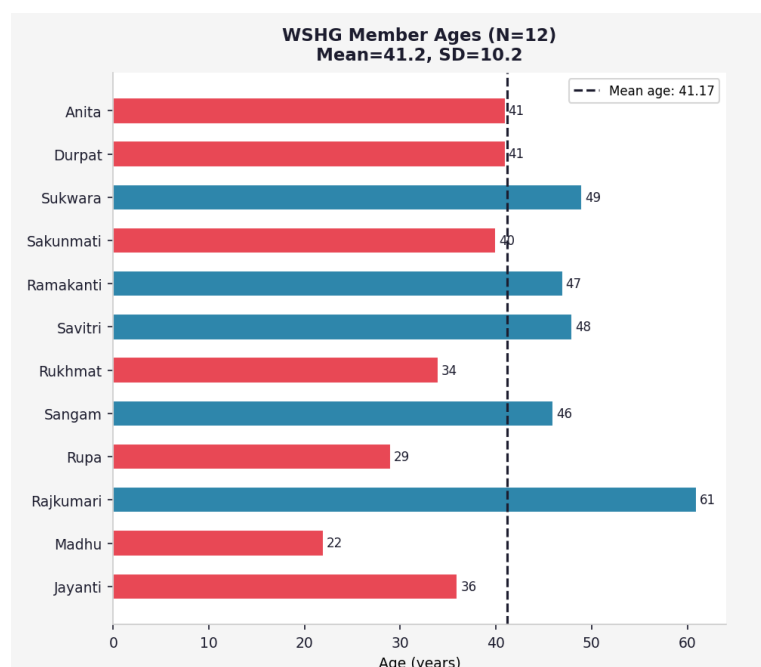


Figure 9: WSHG member chart

This chart shows the individual ages of 12 members of a Women's Self-Help Group (WSHG), with a mean age reference line. Mean age = 41.2 years, SD = 10.2 years — indicating moderate variation, Rajkumari is the oldest at 61 years; Madhu is the youngest at 22 years, most members fall between 34–49 years — a working-age adult group, the dashed vertical line at 41.17 years marks the group mean, Blue bars indicate members above the mean age; red bars indicate below the mean. this gives a human face to the data — showing a diverse but largely middle-aged group of women participating in the scheme.

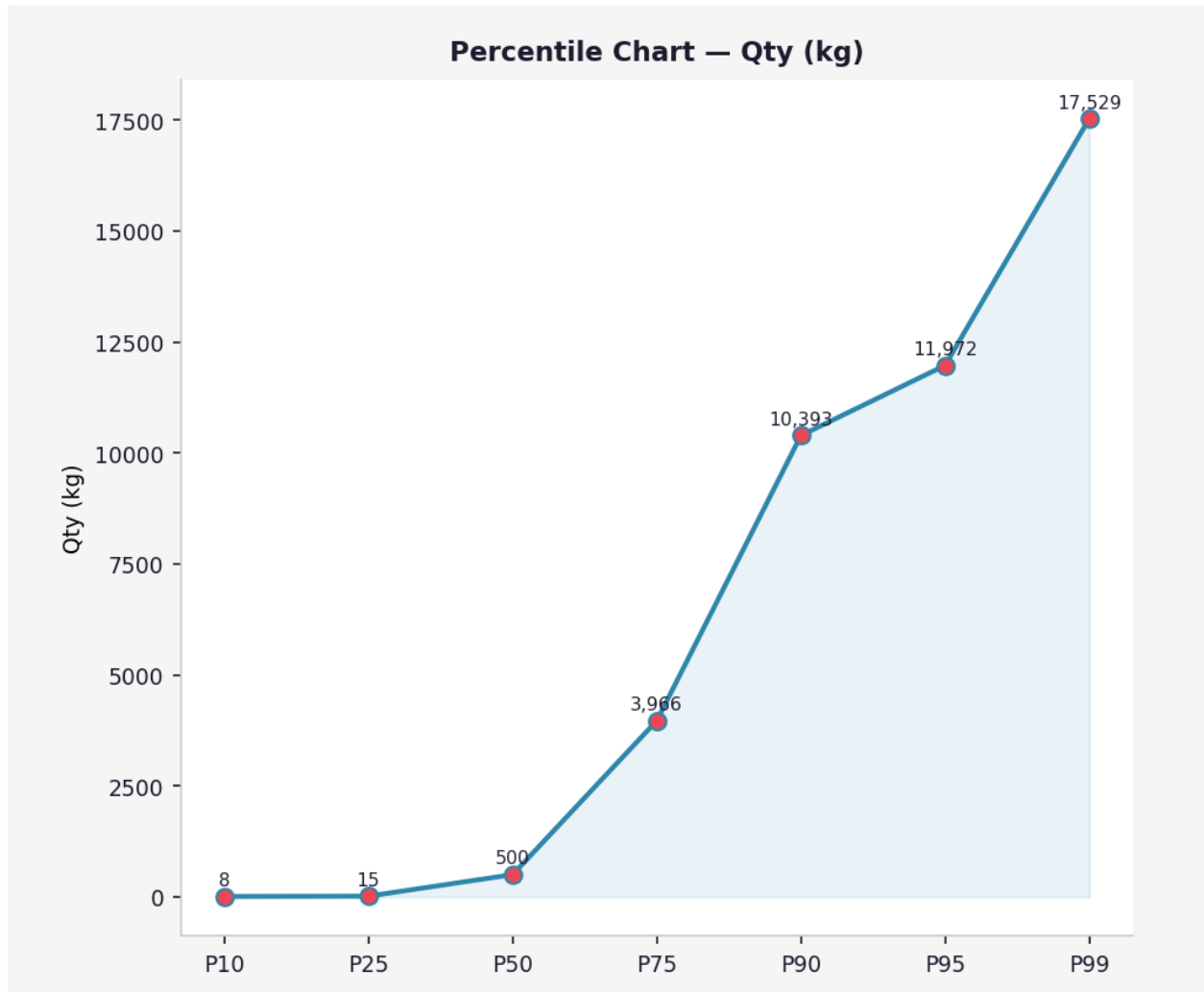


Figure 10: Percentile chart

This line chart plots key percentile values of the quantity data, showing how quantity is distributed across the vendor population. P10 = 8 kg and P25 = 15 kg — the bottom 25% of vendors sold almost nothing. P50 (median) = 500 kg — half of all vendors sold 500 kg or less. P75 = 3,986 kg — the top 25% sold more than ~4,000 kg. P90 = 10,393 kg, P95 = 11,972 kg, P99 = 17,529 kg. The curve rises very steeply after P75, visually confirming the extreme concentration of output among top vendors — a small elite group supplies the bulk of the cow dung.

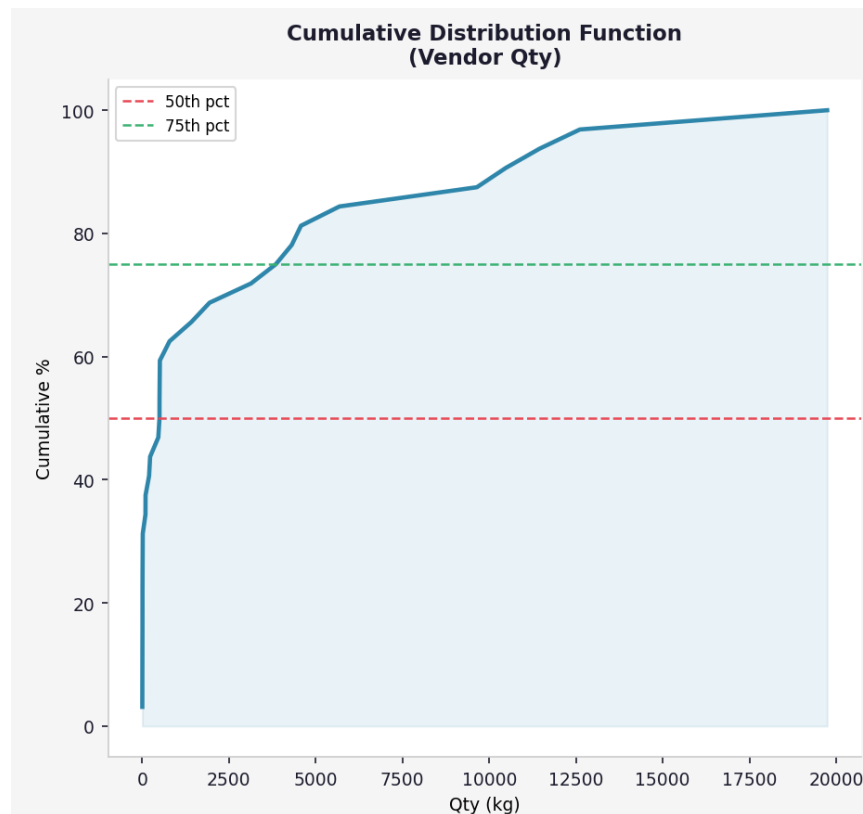


Figure 11: Cumulative Distribution Function

This CDF chart shows the cumulative percentage of vendors at or below any given quantity level. The curve rises very steeply at the left — meaning most vendors cluster near 0 kg, then gradually flattens. By ~2,500 kg, approximately 75% of vendors have already been accounted for (green dashed line = 75th percentile). The red dashed line (50th percentile) is crossed at around 500 kg — matching the median from histogram analysis. The curve barely rises between ~5,000–10,000 kg, suggesting a gap in the distribution — few vendors sell in this mid-range. This confirms the two-tier nature: a large majority of small sellers and a small minority of very large sellers.

V. CONCLUSION

The findings of this study affirm that the Godhan Nyay Yojana has delivered meaningful and measurable livelihood benefits to participating households in Sarkhor village. Through a cumulative cow-dung procurement of 92,849.76 kg and aggregate disbursements of ₹1,85,699.52, the scheme has introduced a reliable supplementary income stream into a community where farm revenues alone are insufficient to meet household needs. All 32 active cow-dung vendors received direct bank transfers within the prescribed settlement period, attesting to the programme's administrative efficiency in benefit delivery. Beyond the income dimension, GNY has generated several co-benefits of enduring significance. The containment of open grazing has reduced damage to standing crops and substantially lowered the incidence of livestock-related road accidents — a long-standing safety hazard in rural Chhattisgarh. Women's active participation through the Gau Mata Mahila Swah Sahayata Samuh has translated into tangible economic agency, reinforcing the broader rural governance objective of gender inclusion. The vermicompost produced at the Sarkhor Gothan has created a local, affordable supply of organic fertiliser, encouraging a transition away from synthetic chemicals and contributing to soil health restoration.

The GNY model demonstrates that a relatively simple, community-anchored intervention — centred on the monetisation of an agricultural by-product — can simultaneously address income poverty, environmental degradation, livestock management, and women's empowerment. The exponential potential of this framework is evident: with Chhattisgarh's livestock base of 1.27 crore animals and India's position as the world's largest cattle economy, a scaled national replication of GNY could contribute significantly to the goal of doubling farmer incomes and advancing the Sustainable Development Goals pertaining to zero hunger, decent work, and responsible consumption.

Future research should examine the long-term sustainability of vermicompost markets under GNY, the scheme's effect on chemical fertiliser consumption at district scale, and the quality of livelihood improvement experienced by WSHG members. Comparative analyses across Chhattisgarh districts would help identify the administrative, infrastructural, and social conditions that maximise GNY's development impact.

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