

# Urban Compost Business Model

Case Example from Krushiyug Farmer Producer Company, Jalna, Maharashtra



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Soil Protection and Rehabilitation of Degraded Soil for Food Security (ProSoil)  
A2/18 Safdarjung Enclave  
New Delhi 110 029 India  
T: +91 49 49 5353  
F: +91 49 49 5391  
E: [info@giz.de](mailto:info@giz.de)  
I: [www.giz.de/india](http://www.giz.de/india)

**Responsible**

Mr. Rajeev Ahal  
Director, Natural Resource Management and Agroecology, GIZ India  
E: [rajeev.ahal@giz.de](mailto:rajeev.ahal@giz.de)

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# Abbreviations

<b>BMZ</b>	German Federal Ministry for Economic Cooperation and Development
<b>FPC</b>	Farmer Producer Company
<b>FPO</b>	Farmer Producer Organisation
<b>FY</b>	Financial Year
<b>GIZ</b>	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
<b>NABARD</b>	National Bank for Agriculture and Rural Development
<b>NAFED</b>	National Agricultural Cooperative Marketing Federation of India Ltd.
<b>NGO</b>	Non-Governmental Organisation
<b>ProSoil</b>	Soil Protection and Rehabilitation of Degraded Soil for Food Security in India
<b>SHG</b>	Self-Help Group
<b>WOTR</b>	Watershed Organisation Trust

# Introduction

**One of the initiatives under the ProSoil project is establishing a business model for compost manufactured using organic waste matter from urban centres. This compost can then be employed for rural agricultural fields, thereby closing the urban-rural nutrient loop.**

The Indo-German development cooperation project 'Soil Protection and Rehabilitation of degraded soil for food security in India (ProSoil)' is implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) in partnership with the National Bank for Agriculture and Rural Development (NABARD). The project is part of a larger global programme under BMZ's Special Initiative "Transformation of Agricultural and Food Systems". The project is implemented in the Indian states of Maharashtra and Madhya Pradesh, and works with local implementation and mainstreaming partners.

One of the initiatives under the project is establishing a business model for compost manufactured using organic waste matter from urban centres. This compost can then be employed for rural agricultural fields, thereby closing the urban-rural nutrient loop.

This detailed project report presents an urban compost business model from the district of Jalna in Maharashtra. Here, the project's NGO partner Watershed Organisation Trust (WOTR) worked with the Krishiyug Farmer Producer Company (FPC) in establishing supply chains and sales of city compost.

Basis expenses and revenues from FY 20-21, FY 21-22 and FY 22-23, this report presents projections and viability of scaling this model.



## About the FPC

The Krushiyug Farmer Producer Company (FPC) was established in the year 2019 and is located in the Goshegaon village of Bhokardan Taluka in the Jalna district. The FPC has 512 registered members, while another 250 people are associated with it for operations. Overall, it covers twelve villages. The FPC board has six members – Yogeshwar Sormare, Uddhav Mohite, Ravsaheb Sormare, Manohar Mohite, Jyoti Mohite, and Sarla Ghode.

The FPC's paid-up capital is **INR 6.11 lakh** against the authorised capital of Rs 10 lakh. The annual turnover has been gradually increasing each year, with the current year's turnover (as of February 2023) being **INR 59.67 lakh**.

**Table 1: Summary of Krishiyug FPC's financials for the last three FYs**

Year	FPC's Turnover	FPC's Profit
2022-23 (as of Feb 23)	INR 59.67 lakh	INR 0.36 lakh
2021-22	INR 44.47 lakh	INR 0.43 lakh
2020-21	INR 20.89 lakh	INR 0.95 lakh

The FPC currently has two business verticals – input-output shop and commodity trading.

Under input-output shop, the key commodities sold include seeds, fertilisers (including city compost), insecticides, and silage bags. Commodity trading covers crops like maize, soyabean, tur and harbhara.

Additionally, the FPC is in the early stages of a pilot project of vermicompost production with support from the Watershed Organization Trust (WOTR).

In the coming years, the FPC is keen on expanding the city compost business and setting up a dal mill, for which the loan application for godown construction (under the National Agricultural Cooperative Marketing Federation of India Ltd. or NAFED) is approved and is likely to be disbursed soon.

The financial performance of the two business verticals over the last three FYs is summarised below:

**Table 2: Financial Performance of business verticals. The above figures have been extracted based on the data provided by the FPC.**

Business Vertical	Year 20-21			Year 21-22			Year 22-23 (up to Feb 23)		
	Purchase Cost (INR lakh)	Revenue from Sales (INR lakh)	Profit (INR lakh)	Purchase Cost (INR lakh)	Revenue from Sales (INR lakh)	Profit (INR lakh)	Purchase Cost (INR lakh)	Revenue from Sales (INR lakh)	Profit (INR lakh)
Input-output shop	18.5	20.89	2.39	42.27	44.47	2.2	29.88	32.3	2.42
Commodity Trading	16.8	18.7	1.9	38.32	40.37	2.05	28.32	30.4	2.08

It is noteworthy that both the business verticals are reasonably profitable. However, they do not account for administrative overhead costs and the loan repayment costs. Therefore, the overall profits of the company as calculated here appear high.

## Means of Financing

The FPC has raised finance through equity, debt, and grants received from development agencies. The total project cost is INR 39.91 lakh, of which INR 29 lakh will be provided by a loan from NABKISAN. The remaining INR 10.91 lakh shall be funded by the FPC's Directors' Fund.

Additionally, the FPC can avail 70% subsidy from the Pokhara scheme after completion of construction.

**Table 3: Loan status of Krishiyug FPC as of March 2023. (\*3% of the interest rate to be refunded through Agriculture Infrastructure Fund)**

Funding agency	Loan type	Loan purpose	Amount	Interest rate	Date	Status	Outstanding
Samunnati Finance	Term loan	Working capital (for input-output shop & commodity trading)	INR 10 lakh	14%	2020-21	Disbursed	Nil
Director personal loan	Term loan	Working capital (For input-output shop & commodity trading)	INR 4.5 lakh	0%	2020-22	Disbursed	Nil
NABKISAN	Infrastructure Loan	Godown construction for commodity storage and dal mill	INR 29 lakh	9%*	-	Sanctioned but not yet disbursed	-

The FPC has also received grants from NABARD and WOTR.

**Table 4: Grants received by Krishiyug FPC**

Donor agency	Purpose of grant	Value of grant	Time period
NABARD	Salary of staff	INR 6 lakh (@ INR 20,000 per month for 2.5 years)	January 2020 to June 2022
WOTR	Material purchase (seeds, fertilizers & insecticides)	INR 7.15 lakh	April 2020- March 2021



The compost is sold in **50kg** bags, which are procured at INR **250** per bag and sold at INR **260** per bag. It is available under the KRIBHCO and RCF brands and is sourced from the Aurangabad Municipal Corporation.

## City Compost: Status Quo and Outlook

The FPC currently deals in compost on two fronts – in supplying city compost as retailer and in vermicompost production.

The FPC has been supplying city compost since 2020-21 through its input-output shop. It has supplied around 265 MT of city compost so far, with 120 MT in 2020-21 and 145 MT in 2021-22. The compost is sold in 50kg bags, which are procured at INR 250 per bag and sold at INR 260 per bag. It is available under the KRIBHCO and RCF brands and is sourced from the Aurangabad Municipal Corporation. Currently, 320 farmers (both FPC members and non-members) and institutions such as WOTR and Jafrabad Self-Help Group (SHG) are among the consumers.



Picture 1: (L) Input-output shop; (R) Compost bags

An assessment of the city compost business shows that it has not yielded any significant profits yet. There is a need to optimise procurement costs and generate more demand among farmers.

Table 5: Financial performance of city compost retail shop

Year	Purchase Cost (INR lakh)	Revenue from Sales (INR lakh)	Profit (INR lakh)
2020-21	1.2	1.5	0.3
2021-22	2.25	2.35	0.1
2022-23	Not yet procured		

The FPC is currently also executing a pilot project of vermicompost production and sale, with the support from WOTR. It entails making 20 vermicompost beds in the two farms of FPC Directors (ten beds in each farm). The FPC bears the production costs in this case. It shall receive a one-time subsidy of 50% from WOTR towards the cost of beds and vermiculture at the beginning. Afterwards, the FPC shall package the vermicompost and sell it to the farmers under its own brand.

Based on the current set-up, it is estimated that vermicompost of around 20 MT can be produced in one cycle of 45 days, and 120 MT can be produced over six cycles in a year. This project has the potential of being developed as a business model for FPCs.





## City Compost Sales: Challenges

Currently, the biggest challenges in running a city compost business for Krishiyug FPC include the following:

- Low availability of working capital for running business operations
- Low space for commodity storage, especially compost
- Low demand of compost among the farmers and low affordability
- Low demand in the post sowing season necessitates separate storage for the compost in godowns. A proposal for construction of a godown with two sheds of 30 ft x 15 ft each is sanctioned for a loan under NABKISAN (see Table 3 above). However, construction operations are contingent on fund disbursement.



## Project Idea and Business Model

Interactions with farmers at the project development phase revealed that farmers who have used compost earlier see its benefits in water retention, pest resistance, crop quality and yield. They indicated their interest in buying the compost but stressed that the price may be kept low – preferably below INR 6/kg. Based on this feedback, a compost selling price of under INR 5/kg is recommended to increase adoption among small and marginal farmers.

The project builds upon two business models – packaged city compost: wholesale, and packaged compost: retail.



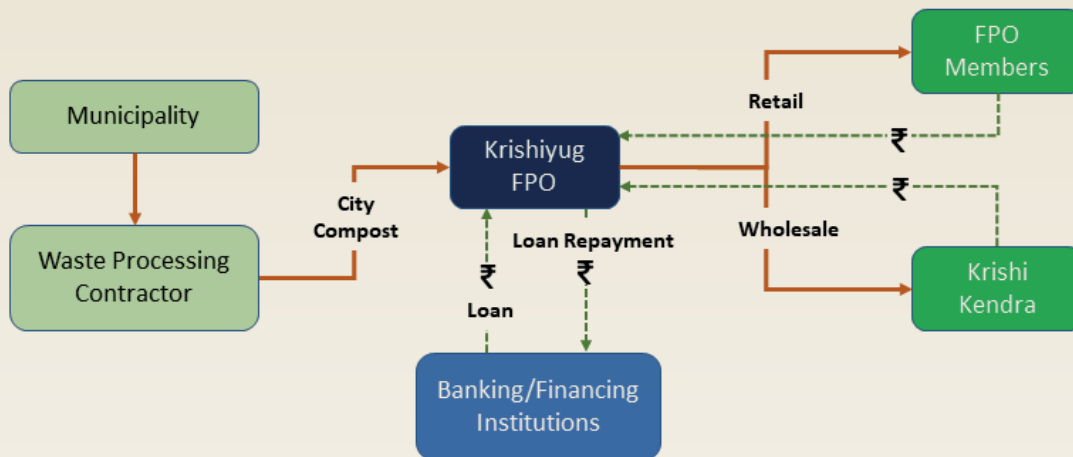
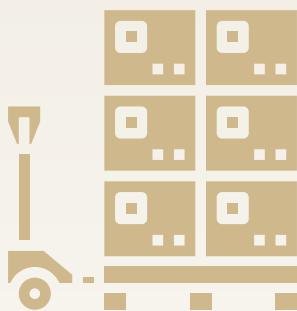


Figure 1: City compost supply chain feeding into wholesale and retail packaged compost sales



### Model 1: Packaged city compost: Wholesale

This model is currently not in practice by the FPC. However, it may be adopted considering the available business opportunities. Local compost producers such as Harit-certified ULBs or private operators may serve as viable sources for procurement. Wholesale buyers such as Krishi Kendras and other similar institutions may be identified for sales.

### Model 2: Packaged city compost: Retail

This model is already in practice by the FPC. However, it can be made more cost efficient by exploring different procurement sources and modes (e.g., in loose/packaged form). Bulk sourcing and using in-house transportation can help reduce costs. For procurement of loose compost, packaging may be done by FPC on site to reduce costs further.



## Impact and Sustainability

The project built upon the above-mentioned models is likely to have significant environmental, social and economic impact. It is expected to improve soil fertility, increase soil water retention, pest resistance, crop productivity, and farmers income. Further, it will generate create employment opportunities for the local farmers and generate revenue for the FPC, leading to economic growth.

For the sustainability of the business model, access to working capital remains a key concern, as purchase of compost requires a considerable spend, and revenue is generated only after sales. Therefore, to ensure sustainability, providing handholding support in subsidy and credit facilities is crucial to FPC.

## Financial Viability

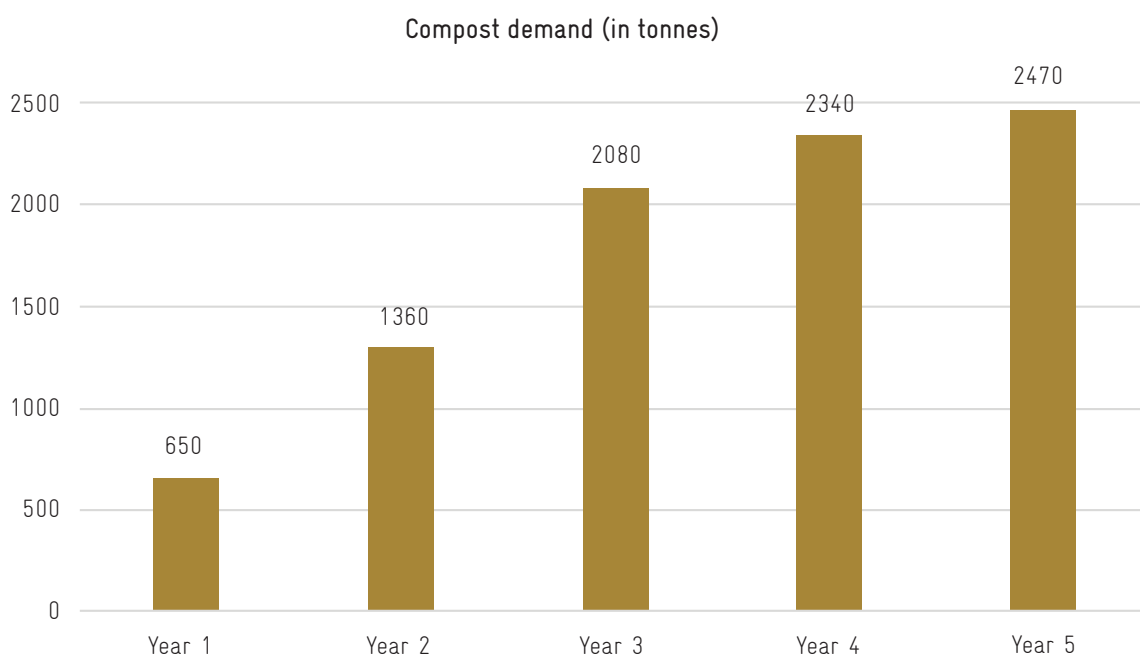
The financial viability assessment of the compost business model considers the market demand for compost, analysis of income and expenditure along with cashflows. Using these, it arrives at the breakeven point for the business, and calculates its working capital requirement.

A potential compost demand of **2,600 tonnes per year** is projected. However, the market potential would be achieved gradually over a period of five years through an increased adoption rate each year.

The assumptions for arriving at the market potential are as under:

- ➔ 400 farmers shall use city compost or vermicompost in their farms.
- ➔ Average land holding per user is 2 acres.
- ➔ Recommended compost usage per acre is 3.25 tonnes.
- ➔ Year-wise adoption rates: Year 1 (25%), Year 2 (50%), Year 3 (80%), Year 4 (90%) & Year 5 (95%).

Based on above adoption rates, compost demand is projected to be 650 tonnes (in the first year), 1,300 tonnes (in the second year), 2,080 tonnes (in the third year), 2,340 tonnes (in the fourth year) and 2,470 tonnes (in the fifth year).



**Figure 2: Compost demand projections**

The market shares of these two models are projected to be 15% for wholesale packaged compost and 85% for retail packaged compost. Accordingly, the compost demand projections across these models are calculated as under:

**Table 6: Breakup of compost demand projections across wholesale and retail. All figures in tonnes.**

Product	Year 1	Year 2	Year 3	Year 4	Year 5
Packaged compost - Wholesale	97.5	195	312	351	370.5
Packed compost - Retail	552.5	1,105	1,768	1,989	2,099.5

## Income-Expenditure Assessment

Key elements considered for an expenditure assessment include procurement cost, equipment costs, salaries, and other costs. The cost of packaged compost is calculated to be INR 2,900 per tonne, assuming bulk sourcing of compost at the production facility. Further, the transportation costs are assumed to be INR 970 per tonne. As for fixed costs, weighing machine is a major capital cost. The cost of salaries is calculated in a manner that accounts for the same manpower being used for multiple operations.

**Table 7: Expenditure assessment**

	Variable Costs	Rate/tonne	Year 1	Year 2	Year 3	Year 4	Year 5
1	Procurement						
1.1	Packed Compost	₹ 2,900	₹ 1,885,000	₹ 3,770,000	₹ 6,032,000	₹ 6,786,000	₹ 7,163,000
2	Transportation Cost	₹ 970	₹ 630,500	₹ 1,261,000	₹ 2,017,600	₹ 2,269,800	₹ 2,395,900
3	Marketing Activities		₹ 40,000	₹ 25,000	₹ 15,000	₹ 15,000	₹ 10,000
	<b>Total Variable Cost (B)</b>		<b>₹ 2,555,500</b>	<b>₹ 5,056,000</b>	<b>₹ 8,064,600</b>	<b>₹ 9,070,800</b>	<b>₹ 9,568,900</b>
	<b>Fixed Costs</b>						
1	Weighing Machine		₹ 15,000				
2	Salaries (apportioned)		₹ 24,000	₹ 25,200	₹ 26,460	₹ 27,783	₹ 29,172
3	Rent		₹ -	₹ -	₹ -	₹ -	₹ -
4	Utilities (electricity/phone)		₹ 9,600	₹ 10,560	₹ 11,616	₹ 12,778	₹ 14,055
5	Legal/CA		₹ 10,000	₹ 10,000	₹ 10,000	₹ 10,000	₹ 10,000
	<b>Total Fixed Cost (C)</b>		<b>₹ 58,600</b>	<b>₹ 45,760</b>	<b>₹ 48,076</b>	<b>₹ 50,561</b>	<b>₹ 53,228</b>
	<b>Others</b>						
1	Stationary		₹ 2,000	₹ 2,000	₹ 2,000	₹ 2,000	₹ 2,000
2	Insurance						
	<b>Total Other Costs (D)</b>		<b>₹ 2,000</b>	<b>₹ 2,000</b>	<b>₹ 2,000</b>	<b>₹ 2,000</b>	<b>₹ 2,000</b>
	<b>Total Expense (B+C+D)</b>		<b>₹ 2,616,100</b>	<b>₹ 5,103,760</b>	<b>₹ 8,114,676</b>	<b>₹ 9,123,361</b>	<b>₹ 9,624,128</b>

Income from sale of compost will be realised during the start of the Kharif and Rabi seasons. Key assumptions for income calculations are as follows:

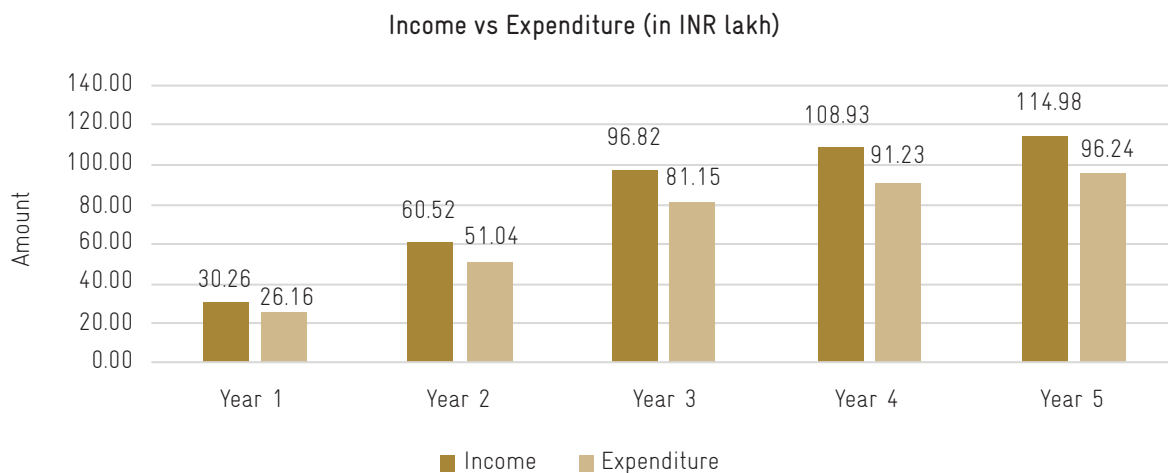
- ➔ 65% of compost sale to happen in the Kharif season (May/June/July)
- ➔ 35% of compost sale to happen in Rabi (November/December/January)
- ➔ Remaining sale to happen throughout the year

Income calculations are based on the sale of packaged compost as wholesale and retail. The selling price is kept low to ensure affordability for farmers and for the financial viability of the project.

**Table 8: Income assessment**

Description	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Income from wholesale of packaged compost</b>	₹ 4,29,000	₹ 8,58,000	₹ 13,72,800	₹ 15,44,400	₹ 16,30,200
<b>Income from retail sales of packaged compost</b>	₹ 25,96,750	₹ 51,93,500	₹ 83,09,600	₹ 93,48,300	₹ 98,67,650
<b>Total revenue</b>	<b>₹ 30,25,750</b>	<b>₹ 60,51,500</b>	<b>₹ 96,82,400</b>	<b>₹ 1,08,92,700</b>	<b>₹ 1,14,97,850</b>

The income projection for the FPC is observed to be more than its expenditure each year, making the project viable.



**Figure 3:** Income vs expenditure for city compost across wholesale and retail

## Cash Flow Analysis

The net cash flow is positive, which makes the project viable. The major elements of the cash inflow include revenue from sale of compost and working capital loan. However, major elements of cash outflow include variable cost, capital expenditure and loan repayment.

**Table 9:** Cash flow statement for Krishiyug FPC

Particulars	Year 1	Year 2	Year 3	Year 4	Year 5
<b>CASH INFLOW</b>					
Revenue for sale of compost	₹ 3,025,750	₹ 6,051,500	₹ 9,682,400	₹ 10,892,700	₹ 11,497,850
Working Capital Loan	₹ 700,000	₹ 300,000	₹ 300,000		
<b>Sub Total (A)</b>	<b>₹ 3,725,750</b>	<b>₹ 6,351,500</b>	<b>₹ 9,982,400</b>	<b>₹ 10,892,700</b>	<b>₹ 11,497,850</b>
<b>CASH OUTFLOW</b>					
Capital Expenditure					
Weighing Machine Purchase	₹ 15,000	₹ -	₹ -	₹ -	₹ -
Other Expenditure	₹ 2,000	₹ 2,000	₹ 2,000	₹ 2,000	₹ 2,000
Variable Cost	₹ 2,555,500	₹ 5,056,000	₹ 8,064,600	₹ 9,070,800	₹ 9,568,900
Fixed Cost	₹ 43,600	₹ 45,760	₹ 48,076	₹ 50,561	₹ 53,228
<b>Loan Repayment</b>					
Interest Expense	₹ 105,000	₹ 150,000	₹ 195,000	₹ 174,688	₹ 28,438
Principal amount return				₹ 650,000	₹ 650,000
Tax	₹ 90,720	₹ 238,748	₹ 411,330	₹ 477,981	₹ 553,233
<b>Sub Total (B)</b>	<b>₹ 2,811,820</b>	<b>₹ 5,492,508</b>	<b>₹ 8,721,006</b>	<b>₹ 10,426,029</b>	<b>₹ 10,855,798</b>
Net Cashflow (A-B)	₹ 913,930	₹ 858,992	₹ 1,261,394	₹ 466,671	₹ 642,052
Operating Cash & Bank		₹ 913,930	₹ 1,772,922	₹ 3,034,316	₹ 3,500,987
Cumulative Cash Balance		₹ 1,772,922	₹ 3,034,316	₹ 3,500,987	₹ 4,143,039

## Breakeven Point

Sale of 128.15 MT of city compost in Year 1 ensures that income and expense are matched. Additional sales contribute to the profit of FPOs.

Table 10: Breakeven calculations

	Year 1	Year 2	Year 3	Year 4	Year 5
Avg. Sale price/tonne	₹ 4,655	₹ 4,655	₹ 4,655	₹ 4,655	₹ 4,655
Purchase/ tonne	₹ 3,870	₹ 3,870	₹ 3,870	₹ 3,870	₹ 3,870
Contribution Margin/ tonne	₹ 785	₹ 785	₹ 785	₹ 785	₹ 785
Other Expense	₹ 100,600	₹ 72,760	₹ 65,076	₹ 67,561	₹ 65,228
Breakeven Sales Quantity (MT)	128.15	92.69	82.90	86.06	83.09

## Working Capital Requirement

Calculations of the working capital requirement are based on the following assumptions:

- 50% of cost recovery will happen at the start of the kharif/rabi season, and remaining at end of the season.
- Payment of compost procurement on credit period of ten days.
- Rate of interest for the loan at 15% per annum.
- FPC will repay only interest in the first three years, and loan amount in the fourth and fifth years from the surplus generated.

Table 11: Working capital requirement

Year 1	Year 2	Year 3	Year 4	Year 5
INR 7,00,000	INR 3,00,000	INR 3,00,000	0	0

Currently, the FPC does not have the requisite cash balance to meet its working capital needs. Banks and financial institutions, including institutions like NABARD and commercial private banks, are potential sources for the same.



## Conclusion

The proposed sale of city compost through input-output shops is a promising business activity for Krishiyug FPC. Since the procurement channels for city compost and its potential customers are already identified and have established trust, the activity is easy to scale.

The compost business supported by a working capital loan is profitable from the first year itself. The profit generated allows FPO to repay the loan in the fourth and fifth years.

**Table 12: Summary of profitability projections**

Return on Capital Employed (RoCE) EBIT/Capital Employed	59%
Break-even Point (BEP) - quantity <sup>1</sup>	128.15 tonnes
Break-even Point (BEP) - sales <sup>2</sup>	INR 5,96,552
Internal Rate of Return (IRR)	128%

Taking compost to most of its members through input-output shops, Krishiyug FPC can increase its profitability, and explore selling nutrient-enriched city compost going forward.



<sup>1</sup> For Year 1

<sup>2</sup> For Year 1

