



# International Journal of Innovative Research in Science Engineering and Technology (IJIRSET)

*(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)*



**Impact Factor: 9.935**

**Volume 15, Issue 5, May 2026**

# Design and Development of Joint Venture

Mr Anil Kumar H.M<sup>1</sup>, H.K Vijaya Kumar<sup>2</sup>, Guna Shekar<sup>2</sup>, S.Adithya Srinvas<sup>2</sup>, Sam Victor<sup>2</sup>

Associate Professor, Department of Civil Engineering, Ballari Institute of Technology and Management, Ballari,  
Karnataka, India<sup>1</sup>

U.G Students, Department of Civil Engineering, Ballari Institute of Technology and Management, Ballari,  
Karnataka, India<sup>2</sup>

**ABSTRACT:** Rapid urbanization and population growth have significantly increased the demand for well-planned residential layouts in developing cities. Efficient land development methods are required to meet this demand while ensuring economic feasibility and sustainability. Joint venture development has emerged as an effective approach in which landowners and developers collaborate to utilize land resources efficiently by sharing investment, risk, and profit. This study focuses on the design and development of a joint venture residential layout in Ballari city. The proposed layout consists of 131 residential plots with proper infrastructure facilities such as roads, drainage systems, water supply networks, underground sewerage systems, parks, and civic amenity spaces. The layout planning is carried out as per local planning authority norms and regulations.

A detailed financial analysis is performed by estimating land cost, development cost, government approval charges, and interest cost. The total income is calculated based on the sale of residential plots. The results indicate that the project yields a net profit of ₹ 32,585,134.78, proving that the project is financially feasible and profitable.

The study highlights the importance of proper planning, efficient land utilization, and financial analysis in joint venture development projects. It also demonstrates how joint venture models can contribute to sustainable urban development and improved quality of life. curing cycles are recommended to achieve structural-grade strength and wider practical applicability.

**KEYWORDS:** Joint Venture, Residential Layout, Land Development, Layout Planning, Financial Analysis, Urban Development, Infrastructure Planning, Cost Estimation, Civil Engineering.

## I. INTRODUCTION

The rapid growth of urban population in India has led to increased demand for residential infrastructure. Cities like Ballari are experiencing steady growth due to industrial development, improved connectivity, and economic opportunities. As a result, there is a need for planned residential layouts that provide basic infrastructure and comfortable living conditions.

Joint venture development has become a popular approach in the real estate sector. In this model, the landowner contributes land while the developer invests in development activities such as roads, drainage, water supply, and other amenities. The profit generated from the project is shared between both parties. This method reduces financial burden on individuals and ensures efficient utilization of land.

Proper layout planning is essential to achieve sustainable development. It involves dividing land into residential plots, roads, parks, and civic amenities. Government authorities specify minimum and maximum limits for each land use category to ensure balanced development. Financial feasibility analysis is another important aspect of land development. It helps in determining whether the project will generate sufficient profit after considering all expenses. This study aims to design a residential layout and evaluate its financial viability using the joint venture model.

## II. LITERATURE SURVEY

Various researchers have studied land development and joint venture models in urban planning. Previous studies highlight the importance of efficient land use planning and financial analysis in real estate projects.

Sharma and Patel (2018) emphasized that proper allocation of land for roads, parks, and civic amenities improves living conditions and increases property value. Their study showed that layouts with better infrastructure attract more buyers.

Reddy and Kumar (2019) analyzed joint venture projects and concluded that this model reduces financial risk by distributing investment between multiple parties. They also highlighted that joint ventures lead to faster project completion.

Gupta et al. (2020) studied urban layout planning and suggested that maintaining balance between residential and non-residential areas is essential for sustainable development. Their research showed that overcrowded layouts reduce long-term value.

Recent studies also focus on sustainability aspects such as rainwater harvesting, green spaces, and energy-efficient planning. These practices improve environmental conditions and enhance quality of life

## III. METHODOLOGY

1. The methodology adopted in this project includes planning, design, cost estimation, and financial analysis.
2. A. Layout Planning
3. The layout was designed for 131 residential plots considering road network, drainage system, water supply, and civic amenities. The design follows planning authority guidelines to ensure proper spacing and accessibility.
4. B. Land Use Distribution
5. The total land area was divided into different categories:
6. Residential plots
7. Roads
8. Parks and open spaces
9. Civic amenities
10. The percentage distribution was maintained within permissible limits.
11. C. Cost Estimation
12. The total project cost includes:
13. Land purchase cost
14. Development cost
15. Government charges
16. Interest cost
17. D. Financial Analysis
18. The total income was calculated based on the sale of plots. Net profit was obtained by subtracting total expenses from total income.

## IV. EXPERIMENTAL RESULTS

The proposed layout includes 131 residential plots with proper infrastructure facilities. The land use distribution is balanced to ensure good planning and comfortable living conditions.

The percentage distribution is as follows:

Residential Area = 53.9%

Roads = 28%

Parks = 11.65%

Civic Amenities = 6.45%

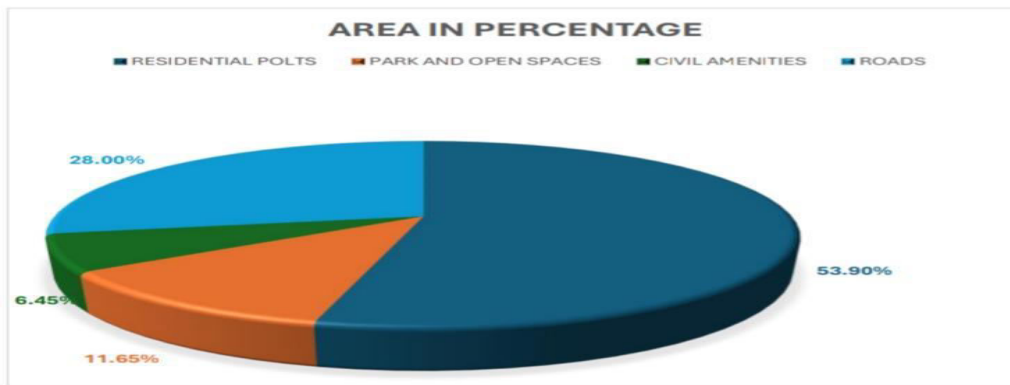
This distribution ensures proper ventilation, accessibility, and future expansion.

Financial Analysis

Table -1

Sl. No	Qty	Unit	Description	Rate	Per	Amount (₹)
1	1291.68	m <sup>3</sup>	Earth work in surface excavation	99.75	m <sup>3</sup>	128845.00
2	844.29	m <sup>3</sup>	Loosening, leveling & compacting ground	110.25	m <sup>3</sup>	93083.00
3	1404	m <sup>3</sup>	Construction of embankment	497	m <sup>3</sup>	698770.80
4	853.3	m <sup>3</sup>	Sub-grade & earthen shoulders	517	m <sup>3</sup>	441711.00
5	2611.35	m <sup>3</sup>	Granular Sub-Base	2611.35	m <sup>3</sup>	2117544.00
6	2686.95	m <sup>3</sup>	Wet Mix Macadam	2686.5	m <sup>3</sup>	2933343.00
7	4635	m <sup>2</sup>	Prime Coat	43.05	m <sup>2</sup>	199537.00
8	4635	m <sup>2</sup>	Tack Coat	16.08	m <sup>2</sup>	77868.00
9	224.25	m <sup>3</sup>	Bituminous Macadam	7835	m <sup>3</sup>	1757021.00
10	112.13	m <sup>3</sup>	SDBC	10659	m <sup>3</sup>	1195208.00
11	191	m <sup>2</sup>	Thermoplastic Road Markings	566	m <sup>2</sup>	106292.00
12	755	Each	Solar Raised Pavement Markers	2205	Each	1664775.00
13	182	No	Avenue Plantation	1102	No	200655.00
14	902.29	m <sup>3</sup>	Earthwork excavation for foundation	107.1	m <sup>3</sup>	96635.00
15	108.02	m <sup>3</sup>	PCC 1:3:6 (M10)	6288.45	m <sup>3</sup>	679260.00
16	23.4	Ton	TMT Steel Reinforcement	94510	Ton	2211343.00
17	389.96	m <sup>3</sup>	RCC M20 Works	12099.92	m <sup>3</sup>	4718536.00
18	130.8	m <sup>3</sup>	Filling with excavated earth	279.3	m <sup>3</sup>	36532.00
19	419.18	m <sup>3</sup>	Excavation for Park / CA	99.75	m <sup>3</sup>	41813.00
20	69.86	m <sup>3</sup>	PCC M10 for leveling	6288.45	m <sup>3</sup>	439327.00
21	149.04	m <sup>3</sup>	Random Rubble Masonry	5891.55	m <sup>3</sup>	878077.00
22	111.78	m <sup>3</sup>	Coursed Rubble Masonry	8603.7	m <sup>3</sup>	961688.00
23	94.39	m <sup>3</sup>	Size Stone Masonry	8305.7	m <sup>3</sup>	783992.00
24	37.37	m <sup>3</sup>	Cement Concrete (Foundation)	6601	m <sup>3</sup>	246680.00
25	85.7	m <sup>3</sup>	Filling with excavated earth	214	m <sup>3</sup>	18357.00
26	1304.1	Kg	Steel tubular structure	142.8	Kg	186225.00
27	931.5	m <sup>2</sup>	GI Chain Link Fencing	843.45	m <sup>2</sup>	785394.00
28	16.8	Kg	Steel welded sections	142.8	Kg	2399.00
29	17.7	m <sup>3</sup>	Earthwork for Kerbs	107.1	m <sup>3</sup>	1896.00
30	898	m	Precast Kerb Stones	486.15	m	436563.00
31	90	m <sup>3</sup>	Filling with excavated earth	214.2	m <sup>3</sup>	19278.00
32	134.7	m <sup>3</sup>	WMM (second layer)	2686.95	m <sup>3</sup>	361932.17
33	898	m <sup>2</sup>	60mm CC Paver Blocks	840	m <sup>2</sup>	754320.00
34	299.33	No	Tree Plantation	112.05	No	330015.00
35	359	m <sup>2</sup>	Primer coat	48.3	m <sup>2</sup>	17340.00
36	359	m <sup>2</sup>	Floor enamel paint	120.75	m <sup>2</sup>	43349.00
37	12	No	Benches (3-seater)	5400	No	64800.00
38	12	No	LED Street Lights	9330.3	No	111964.00
39	5	m <sup>3</sup>	Earthwork for poles	99.75	m <sup>3</sup>	499.00
40	5	m <sup>3</sup>	PCC for poles	6288.45	m <sup>3</sup>	31442.00
41	12	No	Swaged Tubular Poles	15550	No	186600.00
42	1	No	Service & GESCOM Charges	4500	No	4500.00
43	6	No	Borewell + Drip Irrigation + Open Gym	100000	No	600000.00
			<b>TOTAL</b>		₹	<b>26665408.97</b>
44			Miscellaneous Assets		₹	5606999.41
			<b>Grand Total</b>		₹	<b>32272408.38</b>

SL.NO	LAND USE	AREA IN%	MIN % AS PER GOVT
1	RESIDENTIAL POLTS	53.90%	45-60%
2	PARK AND OPEN SPACES	11.65%	10-15%
3	CIVIL AMENITIES	6.45%	5-10%
4	ROADS	28.00%	20-30%
	<b>TOTAL</b>	<b>100.00%</b>	

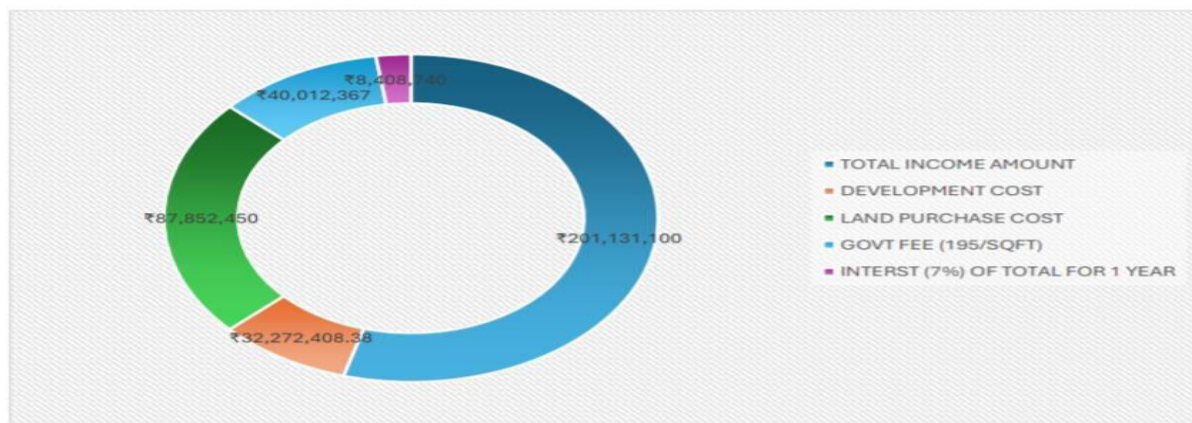
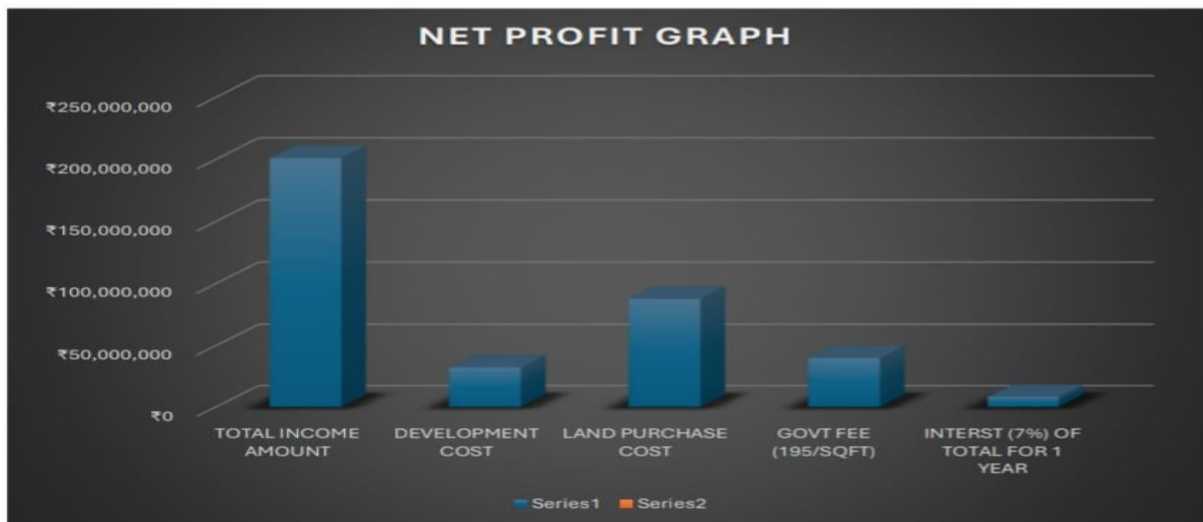


SLNO	FACING OF SITES	SIZE OF PLOT IN METERS	SIZE OF PLOT IN FEETS	NO'S	AREA IN FT	RATE/SQFT	TOTAL INCOME AMOUNT
1	<b>CORNER SITES</b>						
	NORTH WEST	10M X 7 M	32 X 22	3	2112	₹ 2,300	₹ 48,57,600
	NORTH EAST	10 M X 7 M	32 X 22	3	2112	₹ 2,500	₹ 52,80,000
	SOUTH WEST	8 M X 7 M	26 X 22	4	2288	₹ 1,900	₹ 43,47,200
	SOUTH EAST	12 M X 7 M	39 X 22	3	2574	₹ 2,100	₹ 54,05,400
2	<b>ROAD SIDE SITES</b>						
	NORTH WEST	13 M X 7 M	42 X 22	14	12936	₹ 2,300	₹ 2,97,52,800
	NORTH EAST	10 M X 7M	32 X 22	24	16896	₹ 2,500	₹ 4,22,40,000
	SOUTH WEST	8 M X 7 M	26 X 22	39	22308	₹ 1,900	₹ 4,23,85,200
	SOUTH EAST	12 M X 7 M	39 X 22	13	11154	₹ 2,100	₹ 2,34,23,400
3	<b>ODD SITES</b>						
	UNEVEN SIZES			28	21190	₹ 2,050	₹ 4,34,39,500
	<b>TOTAL=</b>			<b>131</b>	<b>93570</b>		<b>₹ 20,11,31,100</b>

NET PROFIT	TOTAL INCOME AMOUNT	DEVELOPMENT COST	LAND PURCHASE COST	GOVT FEE (195/SQFT)	INTERST (7%) OF TOTAL FOR 1 YEAR
	₹ 201,131,100	₹ 32,272,408.38	₹ 87,852,450	₹ 40,012,367	₹ 8,408,740
<b>NET PROFIT=</b>		<b>₹ 32,585,134.78</b>			

Total Income = ₹ 201,131,100  
 Land Cost = ₹ 87,852,450  
 Development Cost = ₹ 32,272,408.38  
 Government Charges = ₹ 40,012,367  
 Interest Cost = ₹ 8,408,740  
 Net Profit = ₹ 32,585,134.78

The analysis clearly shows that the project is financially feasible and profitable. The joint venture model helps in reducing individual financial burden while ensuring better returns.



### V. CONCLUSION

The project titled “Design and Development of Joint Venture Residential Layout” has been successfully completed by carrying out detailed planning, design, estimation, and financial analysis. The joint venture model was adopted to ensure optimum utilization of land, reduce individual financial burden, and provide mutual benefit to both the landowner and the developer.

The total income obtained from the sale of developed plots is ₹2,01,31,100.

The land purchase cost of the project is ₹87,85,2450.

The total development cost required for providing infrastructure facilities such as roads, drainage, water supply, underground sewerage, street lighting, and other civil amenities is ₹3,22,72,408.38.

The government and approval charges at the rate of 195 per square foot amount to ₹4,00,12,367.

The interest cost calculated at 7% for one year is ₹84,08,740.

After considering all the expenditures, the overall net profit of the project is **₹3,25,85,134.78**.

This clearly shows that the proposed joint venture residential layout is financially feasible and profitable.

#### REFERENCES

1. Elena Vesselinov (2007), Gated Communities and Spatial Inequality, Journal of Community Association Law
2. Pranshul sahu, Ritesh kamble (2017), Design of Flexible Pavement using CBR Method, Journal of Mechanical and Production Engineering.
3. Ajibola, M.O, Oloke, O. C, Ogungbemi A. O, (2010) Impacts of Gated Community on Residential Property, Journal of Sustainable Development
4. Nikalesh T. Kankhar, Nishant Y. Rathod, Ballusing Tawar (2016), Design of Flexible Pavement by Various Method, Journal of Research in Advent Technology.
5. Akshit Lamba, L.P.Shrivastava (2017), Intze Tank: A Brief Survey, International Research Journal of Engineering and Technology



INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 9940 572 462  6381 907 438  [ijirset@gmail.com](mailto:ijirset@gmail.com)



[www.ijirset.com](http://www.ijirset.com)

Scan to save the contact details