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Economic analysis of groundnut sprinkler irrigation in Nagapattinam district

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Abstract

The sprinkler irrigation system, a key advancement in contemporary science and technology, was first presented with the hope that widespread adoption would kindle a dynamic spark. The study was conducted in the villages namely Nagakudyan, Edayankadu and Vettaikaraniruppu of Nagapattinam district. The total of 49 farmers were selected as beneficiaries for the study. An interview schedule was developed for collection of the data. production cost of Rs 58,679.08 per ha. The average net return was about Rs.80,135.20 per ha with average B: C ratio of 2.39. This study concluded that under sprinkler irrigation, net return and B: C ratio of groundnut is higher compared to traditional irrigation practices.

Keywords: Sprinkler irrigation, Groundnut, Economics, Nagapattinam

Introduction

Nagapattinam lies on the eastern coast, 350 kms down south of the state capital Chennai and of Tiruchirappalli. Coastal length of the district is 188 kms. Nagappatinam has a coastal area spreading upto 165 kms and marine fishing is practiced in almost 60 villages along the coastline. In India, oilseeds constitute second major agricultural crop next to food grains both in terms of value and production. Amongst the different oilseeds crops, groundnut (*Arachis hypogaea* L.) is one of the important oilseed-cum-money minting legume crops, assume prime importance to the national economy of our country (Nikam,2000). The two key natural resources that are crucial to the production of agriculture are land and water. Using water resources efficiently has become crucial, and sprinkler irrigation is one way to achieve this. The sprinkler irrigation system, a key advancement in contemporary science and technology, was first presented with the hope that widespread adoption would kindle a dynamic spark that would contribute to the country's socioeconomic development (Chaudhary *et al*, 2019) [1]. This study was taken under Tamil Nadu Irrigated Agriculture Modernization Project (TN – IAMP). The World Bank Supported TN IAM (Irrigated Agriculture Modernisation) Project is a follow up of IAMWARM (Irrigated Agriculture Modernisation and Water-Bodies Restoration and Management) Project which has made significant development impacts in the state by modernising irrigation infrastructure, improving water use efficiency, enhancing yields and productivity of agriculture in a climate resilient production systems, diversification towards high value crops, strengthening the institutional reforms through Participatory Irrigation Management (PIM) and Water Users Association (WUA). The IAM Project will bring the policy and institutional development achieved under IAMWARM project to a new level and will serve as the key vehicle for implementing the Tamil Nadu Government agenda in further enhancing water and agriculture productivity in a sub basin framework.

The objectives of the study is To study the economic analysis of groundnut sprinkler irrigation method.

Table 1: Sub Basin detail in Nagapattinam

Total registered ayacut: 8391.52 ha
Fully irrigated: 5820.14 ha
Partially irrigated: 1009.95 ha
Gap: 1561.43 ha

Table 1: Irrigation details of the selected block

S. No.	Block	No. of River/ Channel	Partially irrigated (ha)	Fully irrigated (ha)	Gap (ha)	Total area (ha)
1.	Vedharanyam	1	815.17	762.97	338.07	1916.21
2.	Kilvelur	1	815.7	762.97	338.07	1916.21
3.	Nagapattinam	1	1805.38	45.73	433.92	2285.03
Total		3	3435.72	1571.67	1110.06	6117.45

Methodology

The study was conducted in Nagapattinam district by purposive sampling technique. The villages selected were Nagakudyan, Edayankadu and Vettaikaraniruppu. The total of 49 farmers were selected as beneficiaries for the study. An interview schedule was developed for collection of the data. The data was collected through personal survey method and tabulated analyzed and interpreted in terms of the objectives. The statistical tools used for the study were gross return, net return and BC ratio.

Gross return = Per acre gross returns were calculated based on the sample farmers' total income realized by output times the actual market prices in rupees. Gross income is the value of the main product plus by-products.

Net return = The net return was computed by subtracting to the total (cost c) from the gross return (eands.da.gov.in).

B:C ratio = Gross return/ Net return. (Shende and Meshram, 2015; Nirmala and Muthuraman, 2016) [4, 3].

Results and Discussion

The results are tabulated under the following tables.

Agronomic practices followed for the crop

1. Soil type: Saline soil
2. Source of irrigation: Bore well
3. Variety: GG7
4. Method of sowing: Dibbling the seeds
5. Biofertilizer: *Trichoderma viride, Bacillus subtilis, Rhizobium, Phosphobacteria*
6. Weed management: Imazethapyr (Pursuit)+ one hand hoeing

a) Herbicide applied (30-35 DAT)
b) No. of. hand weeding (15&30 DAT)

7. Irrigation details: 12 irrigation = 430 mm

Quantity of irrigation water (No. of irrigation × Qty. Used/ Irrigation)

Effective Rainfall received (50% Total Rain fall) = 76.5mm

Total water consumed (a+b) = 506.5 mm

Table: 2: Demonstration area and Yield of the groundnut crop

Sl. No	Name of the Groundnut farmer	Village	Demo extent (ha)	Yield (kg/ha)
1	Mathavan	Nagakudyan	0.39	1170
2	Subramaniyan	Nagakudyan	0.56	1680
3	Subramaniyan	Nagakudyan	1.05	4000
4	Veeramani	Nagakudyan	0.53	1590
5	Gunasekaran	Nagakudyan	0.50	1500
6	Ramasamy	Nagakudyan	0.40	1200
7	Perumal	Nagakudyan	0.40	1250
8	Suntharambal	Nagakudyan	0.27	1100
9	Bathmanathan	Nagakudyan	0.65	1950
10	Aruljothi	Nagakudyan	0.40	1200
11	Srinivasan	Nagakudyan	0.53	1800
12	Kala	Nagakudyan	0.37	1500
13	Sathasivam	Nagakudyan	0.41	1230
14	Chelladurai	Nagakudyan	0.30	900
15	Sivakumar	Nagakudyan	0.52	1700
16	Janagairaman	Edayankadu	0.56	1680
17	Sivasanker	Vettaikaraniruppu	0.65	2100
18	Chithravel	Vettaikaraniruppu	0.36	1080
19	Murugan	Vettaikaraniruppu	0.38	1140
20	Baskaran	Vettaikaraniruppu	0.60	1850
21	Vengatesh	Vettaikaraniruppu	0.36	1300
22	Panneerselvam	Vettaikaraniruppu	0.50	1500
23.	Jayshankar	Vettaikaraniruppu	0.24	1000
24.	Regubathy	Vettaikaraniruppu	0.32	1350
25.	Parthasarathy	Vettaikaraniruppu	0.26	1000
26.	Vijayaraghavan	Vettaikaraniruppu	0.40	1600
27.	Gunalan	Vettaikaraniruppu	0.25	1250
28.	Vetriselvan	Vettaikaraniruppu	0.21	1100
29.	Baskaran	Vettaikaraniruppu	0.70	2400
30.	Sasin	Vettaikaraniruppu	0.91	2800
31.	Vijayalakshmi	Vettaikaraniruppu	0.40	1200
32.	Vasanthakumari	Vettaikaraniruppu	0.92	2700
33.	Kasivishwanathan	Vettaikaraniruppu	0.66	2100
34.	Vaduvammal	Vettaikaraniruppu	0.61	1900
35.	Valarmathi	Vettaikaraniruppu	0.80	2400

36.	Sundaramoorthy	Vettaikaraniruppu	0.35	1250
37.	Veeramani	Vettaikaraniruppu	0.80	2400
38.	Thamizhselvan	Vettaikaraniruppu	1.55	6200
39.	Shanmugam	Vettaikaraniruppu	0.30	1100
40.	Vidhyabharathi	Vettaikaraniruppu	0.79	2370
41.	Karthi	Vettaikaraniruppu	0.82	2700
42.	Parasamy	Vettaikaraniruppu	0.64	1920
43.	Sumathi	Vettaikaraniruppu	1.51	5300
44.	Indira	Vettaikaraniruppu	0.66	1980
45.	Vinoth	Vettaikaraniruppu	0.32	1250
46.	Sumathi	Vettaikaraniruppu	1.25	3750
47.	Indhu	Vettaikaraniruppu	1.77	5310
48.	Chithra	Vettaikaraniruppu	0.22	1000
49.	Nagaraj	Vettaikaraniruppu	1.14	3420

Table 3: Economic analysis of the groundnut sprinkler irrigation method

Sl. No	Name of the Groundnut farmer	Expenditure (Rs/ha)	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C Ratio
1	Mathavan	38025	81900	43875	2.1
2	Subramaniyan	54600	117600	63000	2.1
3	Subramaniyan	102375	280000	177625	2.7
4	Veeramani	51675	111300	59625	2.1
5	Gunasekaran	48750	105000	56250	2.1
6	Ramasamy	39000	84000	45000	2.1
7	Perumal	39000	87500	48500	2.2
8	Suntharambal	26325	77000	50675	2.9
9	Bathmanathan	63375	136500	73125	2.1
10	Aruljothi	39000	84000	45000	2.1
11	Srinivasan	51675	126000	74325	2.4
12	Kala	36075	105000	68925	2.9
13	Sathasivam	39975	86100	46125	2.1
14	Chelladurai	29250	63000	33750	2.1
15	Sivakumar	50700	119000	68300	2.3
16	Janagairaman	54600	117600	63000	2.1
17	Sivasanker	63375	147000	83625	2.3
18	Chithravel	35100	75600	40500	2.1
19	Murugan	37050	79800	42750	2.1
20	Baskaran	58500	129500	71000	2.2
21	Vengatesh	35100	91000	55900	2.5
22	Panneerselvam	48750	105000	56250	2.1
23.	Jayshankar	23400	70000	46600	2.9
24.	Regubathy	31200	94500	63300	3.0
25.	Parthasarathy	25350	70000	44650	2.7
26.	Vijayaraghavan	39000	112000	73000	2.8
27.	Gunalan	24375	87500	63125	3.5
28.	Vetriselvan	20475	77000	56525	3.7
29.	Baskaran	68250	168000	99750	2.4
30.	Sasin	88725	196000	107275	2.2
31.	Vijayalakshmi	39000	84000	45000	2.1
32.	Vasanthakumari	89700	189000	99300	2.1
33.	Kasivishwanathan	64350	147000	82650	2.2
34.	Vaduvammal	59475	133000	73525	2.2
35.	Valarmathi	78000	168000	90000	2.1
36.	Sundaramoorthy	34125	87500	53375	2.5
37.	Veeramani	78000	168000	90000	2.1
38.	Thamizhselvan	151125	434000	282875	2.8
39.	Shanmugam	29250	77000	47750	2.6
40.	Vidhyabharathi	77025	165900	88875	2.1
41.	Karthi	79950	189000	109050	2.3
42.	Parasamy	62400	134400	72000	2.1
43.	Sumathi	147225	371000	223775	2.5
44.	Indira	64350	138600	74250	2.1
45.	Vinoth	31200	87500	56300	2.8
46.	Sumathi	121875	262500	140625	2.1
47.	Indhu	172575	371700	199125	2.1
48.	Chithra	21450	70000	48550	3.2
49.	Nagaraj	111150	239400	128250	2.1

All farmers harvested groundnut and sold at the average rate of Rs.66 per kg with an average production cost of Rs 58,679.08 per ha. The average net return was about Rs.80,135.20 per ha with average B: C ratio of 2.39

Conclusion

Under traditional irrigation method, the total production cost is Rs.82,256 per ha. The average net return will be Rs. 57,384. Hence it was concluded that B:C ratio will be higher under sprinkler irrigation system. The findings were similar the findings of Nikkam (2000) [2], where B:C ratio is 2.17 under sprinkler irrigation system.

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