

Augmenting seed supply system in groundnut through Community seed bank in Raichur district, Karnataka

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ABSTRACT

Efforts has been made in this paper to examine the impact of community seed bank on production and improving the livelihood of groundnut growers in Raichur district of Karnataka. The primary data was elicited from the members of GSGA established for introducing few interventions in groundnut production. The time series data on area, production and productivity of groundnut for the period from 1970-71 to 2011-12 was analysed. Similarly, the data pertaining to demand for and supply of seeds for the period 2001-02 to 2011-12 was analysed. Considering the actual SRR, there is no much gap between demand for and supply of seeds but the existing cultivars must be replaced with quality seeds of improved varieties for enhancing productivity followed by production. The interventions in terms of quality seed ICGV-00350, seed treatment with *Rhizobium and Trichoderma*, maintenance of seed purity and buyback arrangement extended to the members of GSGA enhanced the yield and income of groundnut growers. The enrolling of GSGA members to a website helped the groundnut growers in taking right decision on marketing. Some policy implications have been suggested for enhancing the productivity followed by overall production in groundnut.

Keywords: Community seed bank, quality seed, seed replacement rate, seed demand, seed supply, Buyback arrangement

JEL classification: Q12, Q41, Q55

The seed is most critical input in cultivation of crops. It has gained the unique status as a natural resource

evolved with human civilization. A well developed seed system uses the combination of both formal and informal supply channels, market and non-market transactions to stimulate and meet efficiently the growing demand for quality seeds (Maredia *et al.* 1999). In some cases, the seeds demanded had been saved and selected for many generations on local farms. In others, farmers procure planting material in local markets or from other farmers that were initially developed by professional plant breeders. In India, the formal seed sector comprising

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of organized seed supply through public or private or co-operative enterprises. While the informal seed sector is localized normally at the farm or community level and has relatively little organization viz., NGOs, Seed villages and farm-saved seeds exchanged through seed banks.

Community Seed Bank (CSB) is the place where seeds are stored and shared with local growers. The concept of CSB offers access to seed that further helps in enhancing productivity followed by production of different crops on a sustainable basis. Establishing CSB helps the farmers to acquire varieties that are adapted to local conditions; these varieties may not be accessible through formal seed systems, may be costly or may suffer from erratic supplies (FAO, 2014). If farmers, in particular, small farmers with poor resources, can access these locally adapted varieties, it can help them to get access to seeds for the next planting season as well as provide them with an emergency seed supply in times of crisis, thus making them less dependent on the formal seed systems.

The supply of seeds of improved varieties is a costly affair especially in oilseeds crops like groundnut, where the non-availability of seeds of improved variety is a major constraint in most of the groundnut growing countries. In India, there is a huge demand for quality seeds in groundnut that could not be met by the public sector alone (Anonymous, 2013). While the private sector is showing little interest in groundnut seed production due to low seed multiplication ratio, bulky nature of the produce, quick loss of seed viability, high transformation cost, low profit margin and self-pollinated nature of crop. Therefore, multiplication and supply of quality seeds through informal seed system by establishing community seed banks address the problem of decline in area, production and productivity of groundnut in the country. With this backdrop, an attempt to establish Groundnut Seed Growers Association (GSGA) in Raichur district to enhance productivity, income and improving the livelihood of groundnut growers has been attempted.

METHODOLOGY

The primary data was elicited from 135 sample farmers belongs to three taluks of Raichur district. The three villages namely Chikkaheisarur, Piligunda and Kurubadoddi belonging to Lingasugur, Deodurga and Raichur taluka were selected purposively based on highest area under groundnut. The time series data pertains to area, production, productivity was collected from the official websites <http://dacnet/eands>, <http://agristat.com> and <http://des.kar.nic.in>, Government of India and Karnataka. Triennium averages were worked out by bifurcating the data into four sub-periods viz., period I (1971-72 to 1985-86), period II (1986-87 to 2000-01), period III (2001-02 to 2011-12) and overall period IV (1971-72 to 2011-12) to capture the impact of different programmes initiated for enhancing the growth. The data on seed demand and seed supply was collected from the Department of Agriculture, Bangalore and official website <http://www.seednet.com>. The Compound Annual Growth Rate (CAGR) was computed to analyze the trends in groundnut area, production and productivity in Raichur district. The percentages were also worked out for better comparison.

RESULTS AND DISCUSSION

Trends in area, production and productivity of groundnut in Raichur district

The area, production and productivity of groundnut in Raichur district has drastically declined. The groundnut area has declined from 1,23,100 hectares to 38,050 hectares from 1970-71 to 2011-12. The groundnut production has declined from 55,200 tonnes to merely 27,180 tonnes during the same period. The groundnut productivity has accelerated from 448 kgs to 714 kgs per hectare from 1970-71 to 2011-12. A similar trend is observed in CAGR computed for the four periods (Table 1 and Figure 1). The CAGR of groundnut area in Raichur district has declined from -0.51 to -4.89 per cent from period I to period II and it declined further to -10.65 per cent in period III. The overall period experienced a growth of -2.17 per cent. Similar results observed with respect to groundnut production in the district. The

CAGR of groundnut production has declined from 0.09 to -7.26 per cent from period I to period II and it declined further to -9.93 per cent in period III. The overall period experienced a growth of -1.38 per cent. The CAGR of groundnut productivity was positive with 0.51 per cent during the period I and drastically declined to -1.36 per cent in period II but recovered in period III with 1.42 per cent. In the overall period, the groundnut productivity stands at 0.97 per cent. The area and production growth both have declined from the period I to period II and later from period II to period III and even in the overall period.

The decline in area, production and productivity of groundnut in Raichur district is attributed to cultivation of obsolete variety TMV-2 which is low yielding and is susceptible to pests and diseases causing damage to the extent of 25 per cent of the total yield. Even,

the introduction of technology mission on oilseeds introduced during 1986 has not enhanced the sources of growth in groundnut in Raichur district. In this district, groundnut production is more in rabi/summer season in comparison with *kharif* season contributing 80.69 and 19.31 per cent to the total production. The majority of the groundnut cultivated in the district is under irrigated conditions.

Table 1: CAGR of Area, Production and Productivity of Groundnut for the Triennium ending 1971-72 to 2011-12 in Raichur district

Sources of growth	1971-72 to 1985-86 (Period I)	1986-87 to 2000-01 (Period II)	2001-02 to 2011-12 (Period III)	1971-72 to 2011-12 (overall)
Area (%)	-0.51056	-4.89104	-10.6466	-2.16897
Production (%)	0.093672	-7.26115	-9.93238	-1.37949
Productivity (%)	0.512752	-1.35571	1.42353	0.972834

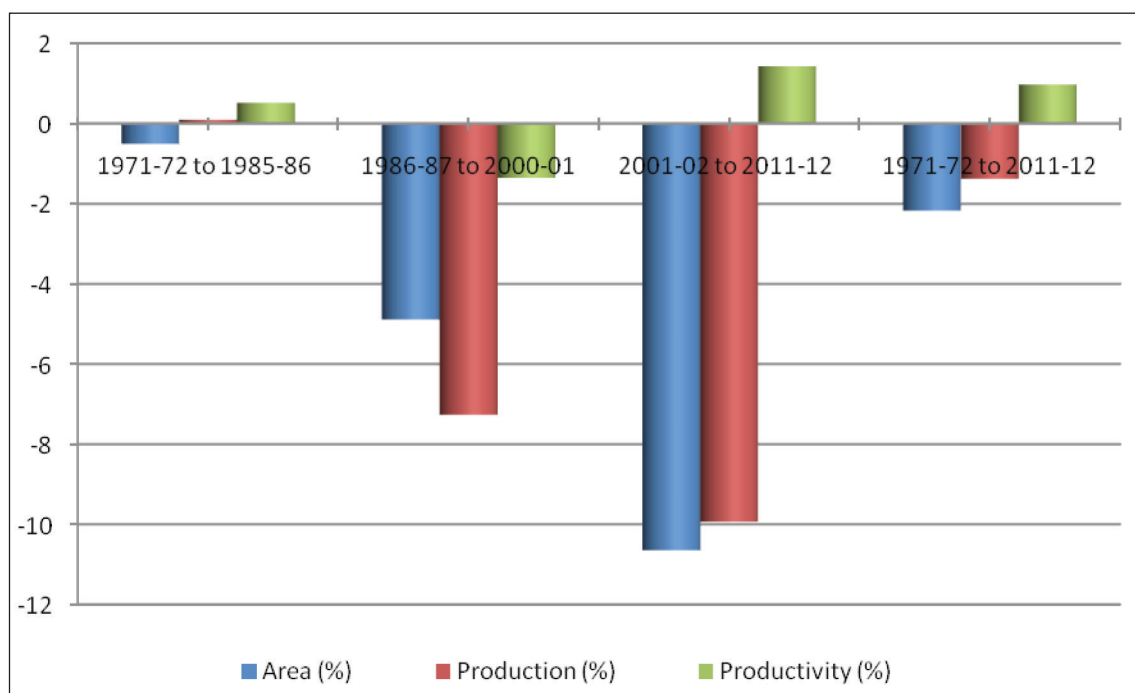


Fig. 1: CAGR of Area, Production and Productivity of Groundnut for the Triennium ending 1952-53 to 2011-12 in Raichur district

Table 2: Demand for and supply of quality seeds in groundnut in India and Karnataka

Year	Area (Ha)		Seed Rate (Q/ha)	Supply Seed Replacement Rate (%)		Seed requirement @100 SRR (Qtls.)		Seed requirement at actual SRR (Qtls.) actual SRR		Seed Supply through all sources (Qtls.)		Gap (%) at 100 SRR		Gap (%) at 100 SRR	
	India	Karnataka		India	Karnataka	India	Karnataka	India	Karnataka	India	Karnataka	India	Karnataka	India	Karnataka
2001-02	6240000	854700	1.5	5.2	2.5	9360000	1282050	486720	32051	525000	37409	94.39	97.08	107.86	116.72
2002-03	5940000	843900	1.5	5.5	4	8910000	1265850	490050	50634	542000	60810	93.92	95.2	110.6	120.1
2003-04	5990000	817300	1.5	11	5	8985000	1225950	988350	61298	700000	74006	92.21	93.96	70.83	120.73
2004-05	6640000	969000	1.5	7.11	5.8	9960000	1453500	708156	84303	718000	82220	92.79	94.34	101.39	97.53
2005-06	6740000	1040000	1.5	6.89	7	10110000	1560000	696579	109200	696000	142302	93.12	90.88	99.92	130.31
2006-07	5620000	763000	1.5	9.79	13	8430000	1144500	825297	148785	989000	147999	88.27	87.07	119.84	99.47
2007-08	6290000	908000	1.5	14.29	12	9435000	1362000	1348262	163440	1443000	140080	84.71	89.72	107.03	85.71
2008-09	6160000	850000	1.5	17.04	10	9240000	1275000	1574496	127500	1590000	119617	82.79	90.62	100.98	93.82
2009-10	5480000	818000	1.5	22.95	25.41	8220000	1227000	1886490	311781	1886000	204563	77.06	83.33	99.97	65.61
2010-11	5950000	848000	1.5	24.5	22.06	8925000	1272000	2186625	280603	2179000	279337	75.59	78.04	99.65	99.55
2011-12	4190000	677000	1.5	22.51	28.82	6285000	1015500	1414754	292667	1783000	253313	71.63	75.06	126.03	86.55
Mean						8896364	1280305	1145980	151115	1186455	140151	86.04	88.66	104.01	101.46

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Table 3: Different forms of intervention through Groundnut Seed Growers Association (GSGA)

Sl. No.	Intervention through GSGA	Action plan initiated
1	Strengthening of seed delivery system	Supplied quality groundnut seed ICGV-00350 and Kadiri-6 to the members of GSGA
2	Enrichment of nutrients	Undertaken seed treatment with Rhizobium and Trichoderma before sowing
3	Screening of seed production plots of members	Maintained seed purity by removing the off-types
4	Buyback arrangement	Procured the unprocessed groundnut ICGV-00350 pods @ @.5000 and @.4200/quintal during 2012-13 and 2013-14 for further distribution to the members
5	Providing market Intelligence information	All the beneficiaries linked to krishimaratavahini.kar.nic.in for market intelligence information which helped them in decision making on marketing of different crops

Table 4: Distribution of inputs to members of GSGA in Raichur district during 2012-13 and 2013-14

Sl. No	No of Beneficiaries Covered	2012 – 13			2013 – 14		
		Kharif	Rabi/Summer	Both	Kharif	Rabi/Summer	Both
1	No. of beneficiaries covered	13 (14.44)	09 (10.00)	22 (24.44)	7 (7.78)	6 (6.67)	13 (14.44)
2	Seeds distributed (Kgs)	190	226	416	214	-	214
3	Pods distributed (Kgs)	360	40	400	-	300	300
4	Rhizobium (Kgs)	3	0.5	3.50	2.50	2	4.50
5	Trichoderma (Kgs)	3	0.5	3.50	2.50	2	4.50

Table 5: Buyback arrangement extended to members of GSGA during 2012-13 and 2013-14 in Raichur district

Particulars	2012-13		2013-14		Both
	Kharif	Rabi/Summer	Kharif	Rabi/Summer	
No. of farmers benefitted	01	01	01	-	03
Quantity of unprocessed pods purchased (qtls)	5.10	1.10	4.79	-	10.99
Procurement Price (Rs/Qtl)	5000	5000	4200	-	-
Income generated by members of GSGA	25500	5500	20118	-	51118

Table 6: Comparative economics of groundnut variety ICGV-00350 Vs TMV-2 in Raichur district

Sl. No.	Particulars	TMV-2		ICGV-00350	
		Value	% Total	Value	% Total
1	Labour expenses (₹/acre)	6047	34.34	5930	31.26
2	Inputs cost (₹/acre)	10914	61.98	12254	64.58
3	Other expenses (₹/acre)	649	3.68	790	04.16
	Total cost (₹/acre)	17610	100	18974	100
A	a. Main product (Kgs/acre)	513		653	
	b. Market price (₹/quintal)	34.72		42.00	
	c. Income from main product (₹/acre)	17811		27426	
B	a. By-product (TL)	0.98		1.00	
	b. Market price (₹/TL)	2262		2200	
	c. Income from by product (₹/acre)	2217		2200	
C	Gross Income (₹/acre)	20028		29626	
D	Net Income (₹/acre)	2418		10652	
E	Returns per rupee of investment	1.14		1.56	

Demand for and supply of quality seeds in groundnut in Karnataka and India

As per the secondary data, there is a huge gap between demand for and supply of quality seeds in India and Karnataka considering 100 % seed replacement rate (SRR) (Table 1). The average seed requirement at all India and in Karnataka stands at 88,96,364 and 12,80,305 quintals at 100 per cent SRR. The average seed supply stands at 11,86,455 and 1,40,151 quintals, respectively from 2001-02 to 2011-12. This means, the seed supply system is meeting 14.00 and 11.00 per cent of the seed requirement at national and state level at 100 % SRR (Table 1). Low seed multiplication rate, the bulkiness of the produce, quick loss of seed viability, high transportation cost and low-profit margin in groundnut are the major factors limiting seed multiplication and distribution to the farmers. Considering the actual SRR over the years, the seed requirement at national and state level stands at 11,45,980 and 1,51,115 quintals which are almost nearer to the seed supply. This means, the existing seed supply system is meeting 100 per cent of the seed requirement both at all India and state

level. Similar scenario observed in Raichur district as well. But the issue is that the existing seed supply has to be replaced with improved varieties of groundnut to enhance the productivity as the present ruling variety (TMV-2) is low yielding and susceptible to pests and diseases. Therefore, the intervention in terms of establishing around nut Seed Growers Association (GSGA) was attempted for strengthening the existing seed production and supply system in Raichur by involving farmers on participatory mode.

Different forms of intervention in groundnut production through GSGA

The formation of GSGA has helped the groundnut growers in several ways (Table 2).

Initially, the quality groundnut ICGV-00350 and Kadri-6 seeds and pods were distributed to the members of GSGA at free of cost. At the time of sowing, groundnut seeds were treated with *Rhizobium* to enhance the nutrient supply to the crop while the seed treatment with *Trichoderma* minimized the incidence of seed-

borne diseases in improved cultivars of groundnut grown by the members. Similarly, removal of off-types resulted in maintaining seed purity before harvesting. After harvesting, the groundnut lots with minimum shelling percentage (70%) and minimum germination percentage (70%) were procured at @.5000 and @.4200 per quintal during 2012-13 and 2013-14 for further distribution to the members of GSGA. Finally, all the members of GSGA were enrolled to the official website: www.krishamaratavahini.kar.nic.in for market intelligence information that helped the members in taking appropriate decision on marketing of produce of different crops.

Buyback arrangement extended to members of GSGA in Raichur district

The buyback arrangement extended to the members of GSGA is presented below (Table 4). The unprocessed truthful labelled groundnut pods belong to members of GSGA was procured @ @.5000 and @.4200 per quintal during 2012-13 and 2013-14. In total, the members of GSGA produced 11 quintals of quality groundnut pods of ICGV-00350, that were procured and distributed to the members for further multiplication. The members of GSGA generated an income of @.51118 through unprocessed truthful labelled groundnut pods. This facility extended to the members generated an additional income of @.515 and @.664 per quintal over the average model price for the past three months before procurement during 2012-13 and 2013-14.

Comparative economics of groundnut variety ICGV-00350 Vs TMV-2

The comparative economics of improved variety ICGV-00350 Vs traditional variety of groundnut is presented here under (Table 6). The total cost of cultivation of ICGV-00350 was higher (@.18,974/acre) in comparison with TMV-2 (@.17,610/acre). The inputs cost including seeds accounted for 64.58 and 61.98 per cent in ICGV-00350 and TMV-2 varieties while the labour expenses accounted for 31.26 and 34.34 per cent of the total cost. The average yield obtained by the members of GSGA in ICGV-350 was higher (653 kg/acre) in comparison with TMV-2 (513 kg/acre). The gross return obtained

by members of GSGA was higher (@.27426/acre) in comparison with TMV-2 (@.20028/acre). Similarly, the net returns realised in ICGV-00350 was higher (@.10652/acre) in comparison with TMV-2 (@.2418/acre). Finally, the returns per rupee investment realised by members of GSGA was higher (1.56) as against TMV-2 (1.14). The introduction of improved variety ICGV-00350 along with buyback arrangement extended to the members enhanced the yield and income by 27.29 and 47.92 per cent, respectively. The same variety is resistant to foliar diseases groundnut bud necrosis and late leaf spot and pests' cutworm and leaf minor.

Summary and policy implications

The growth performance of area, production and productivity is declining in Raichur district signalling towards immediate interventions in groundnut quality seed production and distribution. Considering the present actual SRR, there is no gap between demand for and supply of seeds but the existing seed supply has to be replaced with improved cultivars to arrest the declining growth in area and production. Formation of GSGA in Raichur district has introduced the improved cultivars such as ICGV-00350 and Kadri-6. Seed treatment with *Rhizobium* and *Trichoderma* along with maintenance of seed purity and buyback arrangement for unprocessed truthful labelled pods enhanced the productivity and income of groundnut growers. Therefore, in light of the above the following policy implications have been drawn out of the study.

1. Timely and adequate quantity of supply of quality seeds of improved varieties of groundnut have to be collectively addressed by research institutions, SAUs, KOF and Department of Agriculture by taking up seed production on public-private partnership mode.
2. The seeds of improved varieties of groundnut have to be supplied through RSKs at subsidized rates instead of TMV-2.
3. Institutionalization of seed supply system through community seed banks involving all the stakeholders along the value chain push the productivity and production growth in groundnut.

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