A Study of Analysis of Social Benefits of Agri Clinics & Agri Business Centres (AC&ABC) Scheme

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Abstract

This Paper has quantified and analysed the social benefits viz., tangible and intangible benefits at the entrepreneurial level, at the farmer level and spill over benefits of the Agriclinics and Agri Business Centre Scheme. Primary data were collected from a randomly chosen sample of 160 entrepreneurs and 480 farmers for whom these agripreneurs are providing agricultural extension services. Descriptive statistical techniques and mathematical formulae are used to measure the tangible benefits. Intangible benefits are measured using a Likert 5 point scale. Connecting the tangibles to intangibles using the dummy independent models is another tool used. These Agripreneurs have enjoyed tangible benefits in terms net profit margin, rate of return on investment, net income, increase in household consumption expenditure, increase in the durable assets in their possession, improving quality of education to their children, improving health status and employment generation. There is significant difference between agripreneurs who have improved or rather gained their intangible benefits getting higher tangible benefits than the group of agripreneurs who could not improve the intangible benefits. As a result there is an improvement in investments by farmers, reduction in cost of cultivation, increased productivity, increased income and thereby savings. An econometric model formulated and estimated the impact of agripreneurs extension services on the income of the farmers demonstrate the same result.

Keywords: Agri Clinics and Agri Business Centre, Agripreneurship, Agri Clinics and Agri Business Centres Scheme, India.

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Introduction

Growth and development in entrepreneurship is important for enhancing the employment opportunities to the unemployed, living conditions of the entrepreneurs and a benefit to the society at large. In order to enhance entrepreneurship development in agriculture and to strengthen the extension services provided to the farmers the Ministry of Agriculture and Farmers' Welfare, Government of India had launched the scheme of 'Agri-clinics and Agri -business Centers' (AC &ABC) on 9th April, 2002. Agri-clinics are envisaged to provide expert services and advice to farmers on cropping practices, technology dissemination, crop protection, market trends, prices of various crops in the markets and also clinical services for animal health etc., Agribusiness centers are envisaged to provide inputs such as farm equipment on hire, seeds, fertilizers and other services.

* This Scheme has been implemented throughout the country by providing two months training to the selected candidates and providing bank loans with a back ended composite subsidy. Total number of candidates trained for the country as a whole as on May 2021 are 74520 and number of agri ventures established are 31352 which means 42 per cent of the trained candidates could establish agri ventures. Maharashtra ranks number one in terms of trained candidates and number of ventures established with 18937 and 9195 respectively. Uttar Pradesh is in second position with 16494 trained candidates and 7894 ventures established (www.manage.gov.in)With a view to study the Social benefits generated by the Scheme, a study was conducted by MANAGE.

* This study has its own uniqueness as many existing studies on AC & ABC have analysed the impact of the Scheme on income levels of entrepreneurs and farmers but did not cover the resultant social benefits generated MANAGE (2004) Chandrashekara.P., and Kanaka Durga, P.(2007), Kanaka Durga P. (2016), Shoji Lal Bairwa, et.al (2017), Rajashekhar Karjagi (2018)

Objectives:

The overall objective of this article is to identify measure and analyse the social benefits generated under the AC & ABC Scheme. However, the specific objectives are:

1. To identify, measure and analyse the tangible and intangible benefits accrued to the agripreneurs

2. To identify, measure and analyse the tangible and intangible benefits accrued to the farmers

3. To understand the total benefits (social benefits) generated under the Scheme

This article is divided into three sections. Section1 provides the methodology adopted in terms of sample design and coverage, analytical tools and techniques used to analyse the data. Section 2 discusses the analysis of social benefits (tangible and intangible) accrued to the agripreneurs and farmers. Section 3summarises the findings and recommendations.

Section 1: Methodology

1.1 Sample Design and Coverage:

The study is carried out based on primary data sources which was collected based on multi stage random sampling. In order to have a wider coverage, primary data is collected for all five regions of India viz., South, North, East, West and North East. From each region, one state is selected based on its share in total number of agri ventures established under the AC & ABC Scheme. A state having a maximum number of ventures from each region is selected for analysis. The period considered for the analysis is from April 2002 to December, 2010. In order to have coverage of all the 32 activities which are mentioned in the Scheme Guidelines and benefits accrued activity wise, five (5) agripreneurs are chosen for each activity and hence a total sample of 160 agripreneurs are selected. From the secondary data it is observed that the states Viz., Uttar Pradesh (North) Karnataka (South), Bihar (East), Maharashtra (West) and Assam (North East) are having maximum number of agripreneurs. These states are chosen for conducting this study by collecting the primary data.

The sample 160 agripreneurs are divided among the five states based on the proportionate share in total number of ventures established in their respective states. The same criteria is used for the selection of districts viz. Varanasi,(UP),Bangalore (Karnataka), Patna (Bihar), Pune (Maharashtra) and Kamrup (Assam) as these districts have maximum number of agripreneurs established their ventures Based on this criteria, the sample size are 59 for UP, 43 for Maharashtra, 27 for Karnataka, 27 for Bihar and 4 for Assam (Table 1.1)

With a view to analyse the benefits flowing out of the extension services of agripreneurs three farmers for each Agripreneur are selected at random. Based on this the sample size

of f farmers selected are 177 in UP, 129 in Maharashtra, 81 in Karnataka, 81 in Bihar and 12 in Assam. Thus constitutes a total sample size of 480 farmers (Table 1.1)

Table 1.1: Selected Sample Size of Agripreneurs & Farmers: District Wise

State	District	Number of agripreneurs	Number of Farmers
Uttar Pradesh	Varanasi	59	177
Karnataka	Bangalore	27	81
Bihar	Patna	27	81
Maharashtra	Pune	43	129
Assam	Kamrup	4	12
Total		160	480

1.2 Analytical Tools Used:

The primary data from the selected agripreneurs and farmers is collected with the help of a well-designed pre tested schedule. The collected data has been analyzed based on various qualitative and quantitative techniques. Tangible benefits and intangible benefits accrued to the Agripreneur due to AC & ABC is measured using various qualitative and quantitative techniques. Table 1.2 provides the list of identified tangible and intangible benefits at the Agripreneur level and at the farmer level.

Table 1.2: List of Identified Tangible, Intangible Benefits

At Agripreneur Level		At Farmer Level	
Tangible Benefits	Intangible Benefits	Tangible Benefits	Intangible Benefits
Return on Investment Profitability Diversification in Business Nature of business	Happiness Self confidence stability Risk taking Increase in skill	Increase in farm investment Reduction in cost of cultivation Yield per hectare	Confidence Risk taking Knowledge, Skill

Net Income Household Expenditure Employment Generation Salaries paid to employees Housing Vehicles in possession Education of children Health Status Nature of business Net Income Household	Increase in knowledge Social respect Social contacts Family confidence Credibility with the bank Credibility with the farmers Media coverage	Net income earned Family expenditure Crop diversification	Credibility with the banks

Data were analysed using descriptive and inferential statistics with the aid of SPSS. Descriptive statistical techniques and mathematical formulae are used to measure the tangible benefits. Intangible benefits are measured and analysed using a Likert 5 point scale. A dummy independent model is used to connect the tangible and intangible benefits (Bev Maldrum, Peter Read and Colin Harriso, 2017) This approach helped to translate intangibles into tangibles for mapping and building relationship between them. Some relationships mapped are: Credibility with the farmers vs volume of sales, diversification in business vs number of persons employed and self confidence vs the amount of investment made. An Econometric Model is formulated to estimate the effect of agripreneurs' extension services on the agricultural production and thereby income earned by farmers. The following model is formulated and estimated:

$$Yi = \beta 1 + \beta 2\, X1 + \beta 3 X2 +$$

Where

Y = production (income as a proxy is taken due to the problems of aggregation)

X1 = cropped area

X2 = number of labourers employed

X3 = investment

X4 = irrigated area

X5 = consumption of chemical fertilisers

X6 = agripreneurs extension services (It is a dummy independent variable where it takes the value 1 = with intervention of Agripreneur 0 = other wise

ui = Random Error Term

$\beta 1, \beta 2, \beta 3, \beta 4, \beta 5, \beta 6, \beta 7$ are the parameters to be estimated in the model

Analysis & Results

This section provides the socio-economic profile of the sample agripreneurs and an analysis of tangible and intangible benefits accrued to the agripreneurs and farmers.

2.1: Socio-Economic Profile of the Sample Agripreneurs:

Out of the total 160 agripreneurs, 157 (98 per cent) of the respondents were males. The age wise classification of the respondents shows that 101 respondents belong to the age group of 36-55 years which means 62 per cent of the respondents are below 55 years of age whereas in Varanasi only 49 per cent of the respondents belong to the age group of 25-35 years. Only 6 percent of the respondents belong to the age group of 56 and above. Out of 160 sample agripreneurs, 130 agripreneurs were married, which included 22 from Bangalore, 23 from Patna, and 46 from Varanasi. The field findings showed that unemployment and marital status are strongly linked and the agripreneurs who were well settled in terms of their business, their prospects of marriage have improved. This is one of the important social benefits of AC & ABC Scheme observed in the field. With regard to the status of education, though the guidelines permit the undergraduates

with agriculture subject at their Intermediate or plus two level to undergo training under AC & ABC Scheme, a very less number of sample respondents belong to this category were observed where in 48 sample agripreneurs are post graduates and 101 are graduates. The caste classification of the agripreneurs shows that less than 3 percent of the respondents belong to SC and ST category and it is the case invariably across all sample districts. About 34 per cent of the sample agripreneurs belong to the OBC category which was found to be second important category in caste classification of the sample respondents.

2.2 Business Profile of Sample Agripreneurs:

Table 2.1 shows that out of 160 agripreneurs 60 agripreneurs have established ventures before undertaking AC & ABC training. Majority of the ventures were established after undertaking training in the sample districts.

Table 2.1: Status of Ventures Established by Agripreneur

District	Agripreneurs	Ventures established before the training	Venture established after the training	Total
Bangalore	Number	5	22	27
	Percentage	18.50%	81.50%	100.00%
Kamrup	Number	2	2	4
	Percentage	50.00%	50.00%	100.00%
Patna	Number	13	14	27
	Percentage	48.10%	51.90%	100.00%
Pune	Number	22	21	43
	Percentage	51.20%	48.80%	100.00%
Varanasi	Number	18	41	59
	Percentage	28.60%	25.40%	100.00%
Overall	Number	60	100	160
	Percentage	36.60%	62.40%	100.00%

Table 2.2 shows the activities undertaken by sample agripreneurs. In Bangalore, Agri-Clinics were chosen as the most important activity by sample agripreneurs. Other activities observed were animal feed units, biofertilizer production and marketing, horticulture and tissue culture laboratory. Dairy, poultry and seed processing business units were widely prevalent activities in Kamrup. In Patna, Agriclinics, vermi composting and seed production and marketing activities were undertaken by sample agripreneurs. As per the Guidelines of AC & ABC, the agripreneurs can undertake business in 32 activities (www. manage. gov.in). It was observed that the sample agripreneurs were carrying out business in 19 activities in Pune where as in Varanasi majority of them i.e 51 agripreneurs established agribusiness units only (Table 2.2). The diversity of activities in Pune is due to existing business prospects in these activities which is lacking in Varanasi district.

Table 2.2: Activities Undertaken by Agripreneurs

S.No	Name of the Enterprise	Name of the District				
		Bangalore	Kamrup	Patna	Pune	Varanasi
1	Agri-Clinics	22	0	9	7	1
2	Agri-Clinics and Agri-Business Centres	0		1	5	51
3	Animal Feed Unit	1	1	1	1	1
4	Bio-fertilizer production and Marketing	2		1	1	1
5	Contract Farming				3	
6	Farm Machinery Unit				3	
7	Floriculture				3	
8	Horticulture Clinic	1				
9	Landscaping + Nursery				2	
10	Nursery				2	
11	Organic Production/ Food Chain				4	
12	Pesticides Production and Marketing			2	13	2
13	Value Addition			1		

14	Seed Processing and Marketing	1		4		
15	Soil Testing Laboratory		2		2	1
16	Tissue Culture Unit	1				
17	Vegetable Production and Marketing				3	
18	Vermicomposting / Organic manure			9	3	1
19	Crop Production				6	
20	Dairy/Poultry/Piggary/Goatary		4		4	9
21	Agriculture Journalism				1	

Table 2.3 explains the number of villages and farmers covered by sample agripreneurs across sample districts. It is clear from the table that on an average each agripreneur had covered 17 villages with a maximum of 210 and a minimum of 2 villages. Villages covered by each agripreneur on an average is 28 in Bangalore, 38 in Kamrup, 17,11,16 in Patna, Pune and Varanasi respectively. Each Agripreneur on an average was covering 2451 farmers with a maximum of 50000 and a minimum of 40 farmers. Number of farmers covered per village was highest in Varanasi with 303 and the least in Bangalore with only 13.14 farmers. In Varanasi district, though the number of villages covered by average sample agripreneurs is relatively less when compared to the other districts, the number of farmers covered was relatively higher which was found to be 4848. As the demand for the services of agripreneurs per village is relatively much higher in Varanasi district, the agripreneurs in this district putting concerted efforts intensifying their business in a few villages only.

Table 2.3: Villages & Farmers Covered by Agripreneurs

District	Agripreneurs	Villages Covered	Farmers Covered	Average number of farmers per village
Bangalore	Mean	28	368	13.14
	Minimum	4	60	
	Maximum	210	1100	
Kamrup	Mean	38	1175	30.92
	Minimum	15	200	
	Maximum	50	2000	
Patna	Mean	17	557	32.76
	Minimum	2	40	
	Maximum	165	6000	
Pune	Mean	11	1533	139.36
	Minimum	2	40	
	Maximum	100	50000	
Varanasi	Mean	16	4848	303
	Minimum	2	100	
	Maximum	180	50000	
Total	Mean	17	2451	144.18
	Minimum	2	40	
	Maximum	210	50000	

2.3: Benefits Analysis:

2.3.1: Tangible Benefits:

Tangible benefits which are quantifiable were analysed by measuring the following financial performance indicators:

Investment Analysis

The strength of any business is understood by making an investment analysis. The quantum of economic benefits depends on the financial soundness of an enterprise. In this section, investment carried out on an average by sample agripreneurs was analysed. Investment analysis is carried out by looking at the following aspects:

1 Return on investment 2. Profitability

Table 2.3.1 Average Annual Return on Investment and Profitability of Agripreneurs

S.No.	District	Investment (Rs lakhs)	Sales / Turn Over (Rs Lakhs)	Net Profit Earned (Rs Lakhs)	Net Profit Margin (%)	Return on Capital (ROI) (%)
1	Bangalore	20.78	49.43	30.05	60.79	144.61
2	Kamrup	53.5	100.67	61.65	61.23	115.23
3	Patna	6.8	22.06	16.82	76.25	247.35
4	Pune	15.3	42.36	36.89	87.09	241.11
5	Varanasi	6.48	19.46	12.6	64.74	194.44
6	Average	20.572	46.796	31.60	67.53	153.61

Source: Calculated from Primary Data

ROI = [(Current Value of Investment - Cost of Investment)/Cost of Investment] X 100

Table 2.3.1 shows the average investment made, sales or turn over, operating expenses and net profit earned by the agripreneurs. Investment made varies across districts with a minimum of 6.48 lakhs to a maximum of rupees 53.5 lakhs. The average investment made by each agripreneur is estimated at rupees 20.57 lakhs. Some entrepreneurs in some districts incurred almost same operating expenses in states like Varanasi where as in other they exceeded by 30 to 40 per cent more. In contrary to other states, in Kamrup the operating expenses are less than the investment made. The net profit earned is able to cover both the fixed costs and operating expenses. This shows the viability of the

business. The net profit margin of the ventures is around 60 to 65 per cent for all enterprises. Maximum net profit margin is observed for ventures in Pune followed by Patna. The return on investment is more than 100 per cent for all ventures and for some ventures it is more than 200 per cent. Since most of the ventures established were in Agriclinics and Agribusiness Centers which are mostly services oriented and do not require investment in fixed capital and therefore ROI would be much higher for such enterprises. The high ROI calculations are justified for the fact that most of the business entities in AC & ABC are service oriented.

Table 2.3.2 shows change in investment pattern of agripreneurs who have established ventures before undertaking training in AC & ABC Scheme. It shows clearly that there is a significant increase of investment made by these ventures after the training. On an average the investment increased from 4.8 lakhs to 11.7 lakhs in all most all districts. There is a change in the pattern of investment made by agripreneurs. About eighty per cent of entrepreneurs in all the selected districts invested less than 5 lakhs In the initial years of their business and only 11 per cent of the them invested more than 10 lakhs.. In Maharashtra 86 per cent of the sample agripreneurs invested less than five lakhs and gradually more than 30 per cent of entrepreneurs invested more than 10 lakhs. This may be due to the increasing opportunities of business prospects, which has been considered as one of the indicators of agri business success

Table 2.3.2: Change in Investment Pattern of Agripreneurs who have established ventures before AC & ABC Training

Sate	District	Investment (Rs in Lakhs)	
		Before	After
Assam	Kamrup	1.1	24.0
Maharashtra	Pune	5.7	13.6
Bihar	Patna	2.6	7.0
Karnataka	Bangalore	12.3	22.5
Uttar Pradesh	Varanasi	2.1	7.1
Overall (Average)		4.8	11.7

Change in Services offered:

There is a change in services offered by agripreneurs to farmers which is evident from Table 2.3.3. In order to prosper in business and enjoy economies of scale and economies of scope, majority of the agripreneurs diversified their services from time to time by offering varied services to farmers. Diversification allows for more variety and options for products and services.

Table 2.3.3 : Perception on Status of Services Offered

District		Services Offered		Total
		No change	Change	
Kamrup	No. of Agripreneurs	1	3	4
	Percentage	25	75	100
Pune	No. of Agripreneurs	19	24	43
	Percentage	44.2	55.8	100
Patna	No. of Agripreneurs	22	5	27
	Percentage	81.5	18.5	100
Bangalore	No. of Agripreneurs	6	21	27
	Percentage	22.2	77.8	100
Varanasi	No. of Agripreneurs	14	49	63
	Percentage	22.2	77.8	100
Total	No. of Agripreneurs	62	102	164

Increase in Net Income of Agripreneurs:

The success of a small business depends on its ability to earn profits in sustained manner. Earning a profit is important to a small business because profitability impacts whether a company can secure financing from a bank, attract investors to fund its operations and grow its business. Companies cannot remain in business without turning a profit. In the previous section discussion was made how agripreneurs could make profit and succeeded in business. Table 2.3.4 explains the net income changes of the agripreneurs within three years. The maximum increase in income per month Rs 1.46 lakhs can be observed in

Kamrup 1.36 lakhs in Pune and in other districts the increase was less than Rs 50000. The entrepreneur in all the districts is earning a minimum income of three thousand rupees in the initial years of business and Rs 12000 after 3 years of starting the business. The maximum earnings were Rs 25000 in the initial years and Rs 40000 after three years.

Table 2.3.4: Net Income Earned per Month (Rs in Lakhs)

District		Income Initial years	Income after 3 years	Increase in Mean Income
Kamrup	Mean	.0.21	1.66	1.45
	Minimum	0.10	0.45	
	Maximum	0.30	3.00	
Pune	Mean	0.82	2.18	1.36
	Minimum	.0.20	0.40	
	Maximum	25.00	40.00	
Patna	Mean	0.23	0.49	0.26
	Minimum	0.05	0.15	
	Maximum	0.70	3.50	
Bangalore	Mean	0.30	0.64	0.34
	Minimum	0.05	0.12	
	Maximum	1.80	3.20	
Varanasi	Mean	0.03	0.36	0.33
	Minimum	0.07	0.25	
	Maximum	0.20	4.00	
Total	Mean	0.32	0.94	0.62
	Minimum	0.03	0.12	
	Maximum	25.00	40.00	

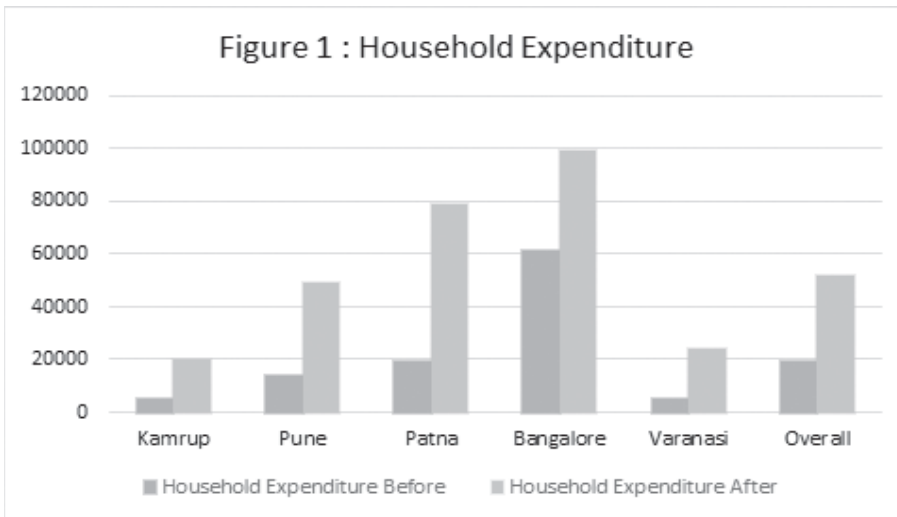
Source: Computed from Primary Data

Increase in Household Expenditure:

Expenses include the amount paid for lodging, food consumption within the house and other costs. Table 2.3.5 and Figure 1 shows the average expenditure per month by agripreneur households towards family expenditure. The income of agripreneurs increased significantly that resulted in increased household expenditure. This is also one of the parameters of increased prosperity. Because the consumption expenditure has not increased in commensurate with the increase in income, savings of the household have gone up. Many of the entrepreneurs converted these savings for the purpose of investment.

Table 2.3.5: Status of Household Expenditure per Month by Agripreneur (Rs. in Lakhs)

District		Expenditure before establishing ventures	Expenditure after establishing ventures
Kamrup	Mean	0.05	0.20
Pune	Mean	0.14	0.49
Patna	Mean	0.19	0.79
Bangalore	Mean	0.61	0.99
Varanasi	Mean	0.05	0.24
Total	Mean	0.19	0.52



Status of Employment Generation by Agripreneur:

Entrepreneurship development in rural industries appears to be the best potential alternative to find employment avenues for the rural population. The unemployed agricultural graduate who became agripreneurs under AC & ABC Scheme is able to provide employment opportunities to other rural unemployed youth (Table 2.3.6). This is one of the most important and direct social benefits which we can notice due to promotion of agripreneurship by the Scheme.

Table 2.3.6 Status of Generation of Employment by Agripreneurs

District	Number of Persons		
	Mean	Minimum	Maximum
Bangalore	4.67	0	46
Kamrup	4.75	2	9
Patna	2.52	0	7
Pune	6.67	0	100
Varanasi	2.79	0	16
Overall Sample	4.12 (Average)	0	100

Source: Computed from Primary Data

Table 2.3.7 shows the housing status of sample agripreneurs. The data analysis shows that more than 30 per cent of them could shift from kuccha house to pucca house due to increased income levels. Almost 50 per cent of them had pacca houses only for a very long period, the field visit made us to understand that furnishings in the houses have improved significantly. The living standards of the agripreneurs improved as they are able to enjoy certain comforts after starting their ventures. A large number of them could able to move from bicycle to two wheeler. An equally important number could buy cars also comfortably (Table 2.3.8).

2.3.2 Intangible Benefits:

Intangible benefits are the gains attributable to the Scheme performance that are not reportable for formal accounting purposes. These benefits are not included in the financial calculations because they are non-monetary though they may be very significant for social impact. The intangible benefits considered in this study are increase in happiness, increase in self confidence, increase in family confidence, increase in society recognition, increase in respect in the society, increase in stability, increase in risk taking ability, increase in business skills, increase in media coverage, increase in credibility with the banks and with farmers.

Table 2.3.7: Housing Status of Agripreneurs:

		Number of Agripreneurs			Total
		Continues to have kuccha house	Change from to kuccha house puccahouse	Continues to have pucca house	
Kamrup	No. of Agripreneurs	1	2	1	4
	Percentage	25	50	25	100
Pune	No. of Agripreneurs	1	16	26	43
	Percentage	2.3	37.2	60.5	100
Patna	No. of Agripreneurs	0	2	25	27
	Percentage	0	7.4	92.6	100
Bangalore	No. of Agripreneurs	15	11	1	27
	Percentage	55.6	40.7	3.7	100
Varanasi	No. of Agripreneurs	4	29	30	63
	Percentage	6.3	46	47.6	100
Overall	No. of Agripreneurs	21	56	83	160
	Percentage	12.8	36.6	50.6	100

Table 2.3.8: Number of Agripreneurs Possessing the Vehicles

District Name	Bicycle only	Bicycle to two wheeler	Two wheeler to four wheeler	Total
Kamrup	1	0	2	4
Pune	0	8	17	43
Patna	2	2	1	27
Bangalore	0	9	13	27
Varanasi	7	38	14	59
Total	10	60	60	160

The perceptions of the agripreneurs on the benefits accrued to them due to AC & ABC Scheme after they became agripreneurs are captured with the help of Likert Scale and the same is presented in tables 2.3.9 to 2.3.11. The estimated Likert Scale shows that the majority of the agripreneurs across all the sample districts have strongly agreed that their happiness levels increased after they became agripreneurs. The Average Likert Scale[1] in the range of 4.5 to 4.9 in districts such as Kamrup, Varanasi and Pune indicates that majority of the agripreneurs strongly agreed that their happiness levels increased after they became agripreneurs due to AC & ABC Scheme because these scales are close to 5 as 5 represents strongly agree. The average Likert Scale which is close to 4 in Patna and Bangalore shows majority of the agripreneurs have just agreed that their happiness levels increased due to AC & ABC Scheme.

[1]Average Likert Scale is calculated by multiplying each response with the respective weight to get total score of that response. Adding the total score of all the responses and dividing it by the number of respondents.

Table 2.3.9: Perception of Agripreneurs on Increase in Happiness Levels Due to Agripreneurship (Likert Scale)

District	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total	Average Likert
Kamrup				8	10	18	4.5
Patna	2	4	15	48	45	114	4.2
Pune	2	10	18	80	100	210	4.9
Bangalore	2	6	18	28	50	104	3.8
Varanasi	0	0	75	80	120	275	4.7

Source: estimated from primary data

Table 2.3.10 shows that the majority of the agripreneurs across all the sample districts have agreed that their confidence levels have increased after they became agripreneurs. The Average Likert Scale of 4.6 in Pune indicates that majority of them have strong agreement on the increased confidence levels. For all other districts majority of them just agreed on this as it is evident from the average Likert Scale at around 4.

Table 2.3.10: Perception of Agripreneurs on Increase in Self Confidence Due to Agripreneurship (Likert Scale)

District	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total	Average Scale
Kamrup				16	0	16	4.0
Patna	0	0	6	40	60	100	3.7
Pune	0	0	9	48	140	197	4.6
Bangalore	0	0	12	56	45	113	4.2
Varanasi	0	0	12	80	125	217	3.7

The Likert Scale for Kamrup district is close to 5 in case of increase in skills, knowledge levels and societal respect and close to 4 in case of increase in risk taking ability and credibility with the farmers shows that there is a strong agreement on the improvement in case of skills, knowledge levels and societal respect and just agreed in case of increase in risk taking and credibility with the farmers. However, majority of the agripreneurs in this

district disagreed on the improvements in their bank credibility. The same findings are observed in Patna, Bangalore and Varanasi. In Pune, improvement in two parameters such as risk taking and credibility are strongly agreed. In all the districts it was observed that the agripreneurs credibility with the banks has not improved as evident from the Likert Scale ranging from 2.9 to 3.8 (Table 2.3.11)

Table 2.3.11: Perception of Agripreneurs on Benefits of AC & ABC Scheme (Likert Scale)

District	Risk Taking	Increase in Skills	Knowledge levels	Societal Respect	Bank credibility	Credibility with the Farmers
Kamrup	4.1	4.8	4.8	4.9	3.1	3.8
Patna	4.2	4.7	4.7	4.8	2.9	3.9
Pune	4.8	4.2	4.2	4.2	3.5	4.5
Bangalore	4.4	4.6	4.6	4.1	3.8	4.8
Varanasi	4.2	4.9	4.9	4.6	3.2	5.0

Source: estimated from primary data

2.4 Connecting the Tangibles to Intangibles:

This approach connects the intangible to a measure that is easier to value, a tangible which means linking a tangible resource to its intangible meanings. Effective interpretation is about connecting one to the other tangibles and intangibles exist together. The tangible and intangibles mapped in this article are credibility with the farmers with the value of sales; diversification in business with the number of persons employed; self confidence with the amount invested; society recognition with the number of visits to the village. Regression coefficient is estimated to establish a connect between tangible indicators and intangible indicators using the dummy independent variable. The value of the estimated regression coefficients are presented in table 2.4.1

Table 2.4.1: Tangible and Intangible Variable Relationship

S.No.	Intangible Indicator	Tangible Indicator	Regression coefficient	t value
1	Credibility with the farmers	Value of Sales	0.80*	3.5
2	Diversification in business	Number of persons employed	0.50*	2.8
3	Self confidence	Amount invested	0.75*	6.8
4	Society recognition	Number of visits to villages	0.83*	2.8

*significant at 1% level

The regression coefficients estimated between tangible indicator and intangible indicator are statistically significant at 1% level. The regression coefficient between credibility with the farmers and value of sales shows that whenever entrepreneur has strong credibility with the farmers there was an increase in his turn over or sales by 80% more than the entrepreneurs who do not have any credibility. The regression coefficient between diversification of business and number of person employed is 0.5 which means employment increases by 50% more with diversification. The amount invested increased by 75% more if the person has self confidence than the person who does not have self confidence. Likewise societal recognition depends on the number of visits to a village. The society recognition is 83% more to an entrepreneur who makes regular visits to provide advisory to the farmer than an entrepreneur who does not visit villages regularly.

2.5: Impact of Agripreneurs' Extension Services on Farmers' Income

This section is intended to find out the role of AC & ABC Agripreneurs in generating social benefits by way of improving the living conditions of farmers by selling quality inputs and providing extension services to the farmers. The average number of farmers covered per village ranged from 13 in Bangalore to 303 in Varanasi. Though the number of villages covered in Varanasi is less than that of Bangalore, farmers covered per village is much higher in Varanasi. On an average each agripreneurs has provided extension services in 17 villages and for 2451 farmers. While supplementing the public extension work these agripreneurs brought significant benefits to the farming community, not only to

the farmers they had covered but also indirectly to other farmers due to their influence.. These spillover effects are also part of social benefits in addition to the tangible and intangible benefits to the agripreneurs and the farmers covered by them.

The impact of agripreneurs' services to farmers are analysed in terms of change in investment, reduction in cost of cultivation, increase in yield and income of the farmers in the study area. Besides extension, several other factors also influence in increasing the yield and income of the farmers. But our hypothesis here is that due to erratic and poor service delivery, insufficient number of extension officers and workers, and a lack of timely advise from extension officers resulted in less investment by farmers, more cost of cultivation, less productivity and thereby less income, less family expenditure and less savings. The alternative hypothesis is that with the intervention of agripreneurs of AC & ABC as extension service providers there is an improvement in investments by farmers, reduction in cost of cultivation, increased productivity, increased income and thereby savings. These indicators are analysed before and after taking the extension services from agripreneurs.

Increase in Investment:

Farmers invest the highest amount in wells and other irrigation followed by agricultural machinery, transport equipment and land improvements. Table 2.5.1 shows the impact of agripreneurs extension services on the investment made by the farmers in the study districts. It is clearly evident from the table that the farm investments with the intervention of agripreneurs. At overall, there is a 92 per cent increase in investment and the maximum increase can be observed in Kamrup in Assam followed by Pune in Maharashtra and Bangalore in Karnataka. The reason behind this increase in investments is the increase in confidence levels of farmers in carrying out farm operations.

Reduction in Cost of Cultivation

The average cost of cultivation of all crops cultivated by sample farmers reduced by 13% in Maharashtra (lowest reduction) and by 26% in Karnataka (highest reduction) and in between these figures in other sample districts (Table 2.5.2).

Table 2.5.1: Investment Made in Agriculture by Sample Farmers (Rs in Lakhs)

S.No.	Name of the State/District	Before taking extension service from Agripreneur	After taking extension service from Agripreneur	% Increase
1	Assam (Kamrup)	0.58	3.44	491
2	Bihar (Patna)	4.69	6.47	38
3	Karnataka (Bangalore)	0.38	0.98	160
4	Maharashtra (Pune)	1.39	3.99	188
5	Uttar Pradesh (Varanasi)	0.20	0.33	65
	Average	1.30	2.49	92

Source: Computed from Primary data

Table 2.5.2: Total Cost of Cultivation of all crops per acre by Sample Farmers (Rs. in lakhs)

S.No.	Name of the State	Before taking extension service from Agripreneur	After taking extension service from Agripreneur	% Change
1	Assam (Kamrup)	0.30	0.25	16.7
2	Bihar (Patna)	0.40	0.32	20.0
3	Karnataka (Bangalore)	0.42	0.31	26.2
4	Maharashtra (Pune)	0.94	0.82	12.8
5	Uttar Pradesh(Varanasi)	0.21	0.18	14.3
	Average	0.45	0.37	17.8

Source: Computed from Primary data

Increase in Farm Yield:

Table 2.5.3 shows the increase in crop yield of all the crops grown by the selected farmers. For overall districts, about 228 farmers got increase in yield in the range of 10-25 per cent and 40 per cent of the farmers got increase in yield in the range of 26-50 per cent. About 88 per cent of farmers' yield increase range from 26 to 75 per cent for overall. This pattern is almost same across districts except in Maharashtra where 67 per cent of the farmers (highest number) received increased yield in the range of 26 to 50 per cent.

Increase in Income:

Table 2.5.4 shows the increase in income. The increase in income of farmers shows the same pattern as increase in yield because both are directly proportional. For overall districts, about 228 farmers got increase in income in the range of 10-25 per cent and 40 per cent of the farmers got increase in income in the range of 26-50 per cent. About 88 per cent of farmers' income increase range from 26 to 75 per cent for overall. This pattern is almost same across districts except in Maharashtra where 67 per cent of the farmers (highest number) received increased income in the range of 26 to 50 per cent. Tables 2.5.6 and 2.5.7 shows increase in income of the farmers before and after taking extension services from Agripreneurs. The income increased per annum is found out to be 94 per cent for overall sample and highest increase is observed for farmers of Kamrup. In Kamrup, income per annum increased from Rs 51000 to Rs 4.25 lakhs. Except in Patna, the increase in income is more than 100 percent.

Table 2.5.3: Increase in Average Farm Yield of all Crops Grown by Selected Farmers

State Name	District Name	Yield Increase (%)					
	Number of Farmers	less than 10	10-25	26-50	51-75	76-100	Total
Assam	Kamrup	0	0	7 (58)	3 (25)	2 (17)	12 (100)
Maharashtra	Pune	0	30 (23)	86 (67)	12 (9)	1 (1)	129 (100)

Bihar	Patna	4 (5)	37 (46)	32 (40)	6 (7)	2 (2)	81 (100)
Karnataka	Bangalore	2 (2)	39 (48)	29 (36)	10 (12)	1 (1)	81 (100)
Uttar Pradesh	Varanasi	13 (7)	122 (69)	38 (21)	4 (2)	0 (0)	177 (100)
Total		19 (4)	228 (48)	192 (40)	35 (7)	6 (1)	480 (100)

Source: Computed from Primary data

Figures in the parentheses are share of number of sample farmers in total

Table 2.5.6: Income Earned per annum in Agriculture by Selected Farmers (Rs in lakhs)

S.No.	Name of the State	Before taking extension service from Agripreneur	After taking extension service from Agripreneur	% Change
1	Assam (Kamrup)	0.51	4.25	728
2	Bihar (Patna)	7.40	12.21	65
3	Karnataka (Bangalore)	1.32	3.36	155
4	Maharashtra (Pune)	2.65	5.62	112
5	Uttar Pradesh (Varanasi)	0.86	1.72	101
	Overall	2.48	4.81	94

Increase in Credibility of Farmers with the Banks:

Table 2.5.7shows the status of credibility of farmers with banks before taking extension services from agripreneurs and after taking extension services from agripreneurs. The Table 2.5.7 shows that a few farmers were having credibility with the banks before taking the extension services from agripreneurs. After a substantial income gain, the credibility with the banks, though not 100 per cent increased rather increased at a significant rate.

Out of 480 sample farmers 232 farmers gained credibility with the banks may be because of increased propensity to repay the bank loan. All the farmers in Bangalore district have shown some improvement with the banks they are linked to. But in Uttar Pradesh, less than 50 per cent of sample farmers gained credibility with the banks. In addition to these gains, sample farmers were ready and able to take risk and their confidence levels increased significantly.

Table 2.5.7: Credibility of Sample Farmers with the Banks

S.No.	Name of the State	Number of Farmers having credibility with the Banks		
		Before	After	Number of farmers with increase in credibility
1	Assam (Kamrup)	1	8	7
2	Bihar (Patna)	43	69	23
3	Karnataka (Bangalore)	2	81	79
4	Maharashtra (Pune)	35	86	51
5	Uttar Pradesh (Varanasi)	10	84	74
	Overall	92	324	232

Source: primary data

2.6 Results of Multiple Linear Regression Model to show the effect of Agripreneurs' Extension Services on sample Farmers Income

The purpose of this section is to analyze the factors influencing farmers' income via increase in crop yields with the help of estimating a multiple regression model specified in section 2. The model gives the following results:

$$Y = 2562 + 1.523\ X1 + 0.85\ X2 + 2.67\ X3 + 3.15\ X4 + 0.65\ X5 + 6.82\ X6$$

t value (2.43) (3.85) (2.87) (4.25) (1.98) (10.25)

$R2 = 0.98$

The coefficient attached to the variable X6 in the above estimated equation provides us the effect of agripreneurs' services on the income of the farmers. The model is in support of our hypothesis that increase in farmers income is mainly due to the extension services of agripreneurs because only this variable distinguishes the two groups of farmers viz., a group of farmers who took extension services from agripreneurs and otherwise.

Conclusion:

This study has quantified and analysed the social benefits viz., tangible and intangible benefits at the entrepreneurial level, at the farmer level and spill over benefits of the Agriclinics and Agri Business Centre Scheme. The study reveals that Agripreneurs have enjoyed tangible benefits in terms net profit margin, rate of return on investment, net income, increase in household consumption expenditure, increase in the durable assets in their possession, improving quality of education to their children, improving health status and employment generation. There is significant difference between agripreneurs who have improved or rather gained their intangible benefits getting higher tangible benefits than the group of agripreneurs who could not improve the intangible benefits. As a result there is an improvement in investments by farmers, reduction in cost of cultivation, increased productivity, increased income and thereby savings.

Because the Scheme has immense benefits in terms of providing employment opportunities to the unemployed and bridging the gap in agricultural extension, the Government has to strengthen the loan and subsidy support by strictly enforcing "One bank branch - One Agriclinics policy" where each branch is mandated to provide support to attest one agripreneurs every year.

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