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Performance of spice-based enterprises facilitated through Agri-Business Incubators (ABI)

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Abstract

Many agricultural institutes have initiated Agri-Business Incubators (ABI) aimed at venture creation in agriculture. The paper analysed the performance of spice enterprises promoted through ABI associated with ICAR - Indian Institute of Spices Research (IISR), Calicut. The results detailed the socio-economic characteristics of entrepreneurs who graduated from the ABI and described their product and technological profile. The results showed that the majority of enterprises were in the nascent stage and needed technical and financial support to expand further. Spice powder technology from the ABI was used by most enterprises and were selected for in-depth economic feasibility analysis using the breakeven point (BEP) method. Average units of production for a breakeven point were estimated at the production of 500 units' stage, and total cost of Rs 150000 wherein the enterprises were considered operational at profitable levels. The relatively small size of BEP confirmed the feasibility of spice powder technology for small and micro enterprises. The findings suggest that the entrepreneurs who completed the business incubation program had a greater success irrespective of the business size. The results hold policy implications in promoting ABIs as technology facilitators in entrepreneurship development in agriculture.

Keywords: Agribusiness Incubator (ABI), Agri-preneurship, Break-even analysis, Performance analysis, Spice enterprises.

Introduction

Indian agriculture is in a phase of economic transition where entrepreneurship development holds the centre stage. Agri-Business Incubation (ABI)centres formed a flagship government program aimed to tap innovations and technologies for venture creation in agriculture. In India, ABIs emerged from the Agri-Business Incubation program of 2003, which was initiated under the International Crops Research Institute for Semi-Arid Tropics (ICRISAT) in partnership with the Department of Science and Technology (DST), Government of India (Sharma et al*.,* 2014). In this process, incubation facilities and expertise available with participating academic, technical, management and R&D institutions are being utilised individually or collectively to harness synergies. They mostly focus on agri-preneurship and agribusiness training in product diversification and value addition that facilitate entrepreneurship development. Many agricultural institutes in the country have initiated Agri-Business Incubation (ABI) centres to support individuals interested in starting agri-based enterprises. Kerala has taken the lead in promoting the food processing sector especially in fruits and vegetables, plantation crops, spices, fish and tubers with incubation centres established under different institutes such as KAU Thrissur, CPCRI Kasargod, IISR Calicut, CIFT Kochi, and CTCRI Thiruvananthapuram, respectively. However, studies that evaluated the performance of agrienterprises incubated through the ABIs have been limited.

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The paper presents the performance analysis results of enterprises promoted through ABI associated with ICAR- Indian Institute of Spices Research (IISR), Calicut. The ABI promoted spice based enterprises, an important trade commodity from Kerala exclusively. Moreover, spices dominated the current agricultural export from India (Sakamma, 2009; Meena et al., 2018; Muthupand et al., 2018) and the demand for value-added spice products such as oils, oleoresin, spice powder etc. have recorded drastic increase in the last two decades (Mani and Kabiraj, 2019). This shift in consumer preferences to such value-added products in spices both at the global and domestic markets have widened the scope for entrepreneurship development in spices. In this context, the results presented in this paper, which form part of the study that describes the performance of agri-enterprises graduated from the ABIs of Kerala, assume significance.

Materials and Methods

The *ex-post facto* research design was adopted for the study. The results are based on the analysis of data collected from 30 agri-entrepreneurs purposively selected from the ICAR-IISR-ABI, Calicut. Personal interview using semi-structured interview schedule prepared for the purpose was used to collect information on entrepreneurial and socio-economic characteristics of the selected enterprises. The performance indicators such as type of product, technology used, present stage of enterprise and markets covered related to enterprises facilitated by the ABI was included based on literature search and expert consultancy.

Spice powder processing was the commercial technology that was used by a maximum number of graduated incubates from the ABI. Hence 19 enterprises in spice powder manufacture were selected as sample for detailed performance analysis. The representative enterprises selected had almost thesame year of establishment and were in business for at least four years during 2016-2019. Average values of data collected from records maintained by the selected enterprises on fixed and variable costs of production, quantity of production and sales, sale prices and related information were used to assess the average performance of these enterprises on the selected major product of spice powder. BreakEven analysis was used in the assessment based on the assumption of constant input price, technology, and selling price. Estimation of Break Even Point (BEP) followed the algebraic approach using equation (1).

$$BEP = F/P\text{-}V \quad \text{——————} \quad (1)$$

BEP = Break Even Point; F=Fixed Cost for production; P=Price per unit of product; V=Variable cost per unit of product.

If the production and sales of theselected product of the enterprises weremore than the calculated BEP, such enterprises were considered successful. If production and sales in the enterprises wereless than the BEP, they were classified as unsuccessful enterprises. Descriptive statistics like mean, and percentages were also used in the analysis.

Results and Discussion

The detailed description of ICAR-IISR-ABI, Calicutwith respect to the technologies and services supported through it for commercialisation and incubates who availed its services since its inception in 2013 is presented in Table 1.

Table 1. Details of spice technology facilitation through ICAR-IISR –ABI, Calicut (2013-18)

Name of ABI	Year of establish-ment	Average annual technology fees collection (Rs)	Average annual turnover (Rs)	No. of enterprises			No. of technologies	
				Registered	Graduated	In business	Available	Commercialised
IISR, Calicut	2013	15000-100000	100000 - 150000	70	40	30	10	05*

*Spice powder both normal and fortified included as separate cases

Table 2. Details of commercialised technologies promoted from ICAR-IISR-ABI, Calicut (2013 - 18)

	Product	Technology	Advantage	Stage of technology transfer
1.	White pepper	Bacterial fermentation technology	Production of high quality off odour free pepper	Developed 'microbial inoculant' for converting berries into white pepper
2.	Bio - capsules of AIMO	Storing and delivering PGPR microbes through bio capsules	• Alternative to existing bio-fertilizer formulation • Easy and reliable technology	Delivery of AIMO bio-capsules to spice growing farmers
3.	Coated spice seeds	Seed coating technology	• Coating strains of PGPR on seed spices • Enhance yield from 15-30 per cent	Trails were conducted in vegetable seeds in collaboration with KAU
4.	Spice powders (Normal and Fortified)	Spice powder processing	Production of high-quality spice powder	Technical guidance and processing facilities in spice powder making

The average annual technology fees collected was in the range of Rs 15000 to 100000, and the average annual turnover ranged between Rs 1-1.5 lakhs. Among the 70 registered incubates, 40 graduated, and 30 were in business at the time of investigation (2018). It could also be observed from the results that there were 05 commercialised technologies for which technology backstopping and handholding services were provided from the ABI. The details of the commercialised spice technologies from ICAR-IISR-ABI, Calicutare depicted in Table 2. The stage in whichtransfer of technology (ToT) is effected and the specific advantages associated with its use are detailed. The results indicated that production of high-quality spice powder which used the technical guidance and processing facilities at the ABI had high acceptability in market due to the credibility of being free from adulterants. Agriculturally Important Micro-organisms (AIMO) bio-capsules promoted by IISR-ABI with the potential for use by spice growing farmers was another product which was gaining popularity as an easy and reliable alternative to existing bio-fertilizer formulations. Coating strains of PGPR on seed spices that could enhance yield by 15-30 per cent was another product promoted through the ABI.

Socio-economic and technological profile

The socio-economic and technological profile of enterprises incubated at the ICAR-IISR-ABI, Calicut,was also attempted. The socio-economic profile of the spice-based entrepreneurs graduated from ICAR-IISR-ABI, Calicut are presented in Table 3. Average age of the respondents in the study

Table 3. Socio-economic profile of spice entrepreneurs graduated from ABI-IISR (n=30)

Sl. No.	Entrepreneurial characteristic	Mean (unit) (%)
1.	Age of entrepreneurs (years)	42.31
	Below 35 years (young)	25.6 (24)
	Between 35-50 years (Middle aged)	41.82 (58)
	Above 50 years (Seniors)	59.5 (18)
2.	Education (Type)	
	General education	Higher Secondary (38)
	Technical education	Engineering Diploma (62)
3.	Entrepreneurship status (Frequency)	
	First generation entrepreneurs	24 (78)
	Family inherited entrepreneur	04 (14)
	NRI returned entrepreneurs	01 (04)
	Ex-employee turned entrepreneur	01 (04)
4.	Type of enterprise (No.)	
	Processing and value addition	25 (84)
	Agrl. Services	01 (02)
	Allied activities (bio-inoculant capsules)	04 (14)
5	Stage of enterprise at joining ABI(Frequency)	
	Nascent (Idea/proven potential stage)	17 (56)
	Young (Started informal marketing stage)	11 (36)
	Mature (Started formal marketing but yet to make profit)	02 (08)
6	Ownership & registration	
	Individual Proprietorship	20 (66)
	Limited Liability Partnership	06 (20)
	Farmer Producer Company	02 (07)
	Cooperatives	02 (07)

was 42.31 years. Most of the respondents(58 %) belonged to middle age group of 35-50 years. They were followed by 24 per cent of young aged (less than 35 years) entrepreneurs, and finally 18 per cent of entrepreneurs belonged to the senior age group (above 50 years). Results from the table confirmed that the middle-agedgroup were more involved in entrepreneurship activities and were better equipped

to run the business successfully. This could be explained in terms ofthe better risk bearing ability of middle-aged people emerging fromtheir experience to solve problems that came in the way of successful entrepreneurship. Similar results were identified by Chowdhry (2019) in her study on agri-entrepreneurs.The education status of the entrepreneurs indicated that 62 per cent had technical qualifications such as Degree or Diploma in Engineering and the remaining hadgeneral education. The results also confirmedthe findings of Chowdhry (2019) that higher education levels, particularlyin technical subjects like engineering showed a bettersuccess rate as entrepreneurs. The results also revealed that 78 per cent of the entrepreneurs studied were first-generation entrepreneurs i.e., they were the first to enter the entrepreneurship or business from their families. However, 14 per cent of the respondents had inherited enterprise from their parents or ancestors, and one was a foreign returnee (NRI) who had started the enterprise to help the society by creating employment opportunities. There was also an employee turned entrepreneur who turned to own business after getting sufficient experience in the specified area.

Most of the enterprises in the study were related to the processing and value addition of spices *i.e.*, 84 per cent were in the processing and value addition sector. There was also 14 per cent of the entrepreneurs who were engaged in allied activities, and only two per cent of the entrepreneurs were engaged in agriculture services related to spices.The prominence of processing and value addition in entrepreneurship can be related to the predominance of value addition technologies promoted by the ICAR-IISR-ABI, Calicut, to fill the gap of availability of quality value-added spice products in the markets. The stage of the enterprise was another important factor considered in feasibility analysis as the stage of the enterprise directly affected the product manufacturing and marketing capacity. Enterprises in the study werefound to be mostly at the nascent stage (56%), followed by the young stage (36%) and only eight per cent of the entrepreneurs were in the matured stage of entrepreneurship. This indicated that most of the enterprises were started in the period 2013-2018, and these enterprises still neededsupport from incubation centres to run efficiently.The enterprise's ownership and registrationwas another important factor that influenced entrepreneurial efficiency as itaffected timely decisions and influenced therisk-bearing capacity. It was found that 66 per cent of the enterprises wereunder individual proprietorship, where decision making was easier and faster. However, there were 20 per cent of enterprises which came under limited liability partnership (LLP), seven per cent each under the farmer producer companies(FPC) and co-operatives sector, respectively. Since, majority of the enterprises were under sole proprietorship, it was easy to convince on technology decisions and facilitate the works towards the set goals.

Technological and economic attributes of the enterprises were also assessed, and the results are given in Table 4. It could be observed from the results that all entrepreneurs in the study had availed the support of subsidy/incentive under

Table 4. Technological and economic attributes of spice enterprises facilitated through the ABI

Sl. No.	Entrepreneurial characteristic (unit)	Frequency (%)
1.	Sources of subsidised funding received (Frequency)	
	Entrepreneur Support Scheme (ESS)	04 (12)
	Procurement & Market Support Scheme (P&MSS)	04 (12)
	Prime Minister's Employment Generation Programme (PMEGP)	08 (28)
	Pradhan Mantri Mudra Yojana (PMMY)	07 (24)
	Other funding with subsidies	07 (24)
2.	No. of workers employed per enterprise (Mean)	
	1-5 (Mean 3.24)	21 (72)
	6-10 (Mean 7.4)	05 (16)
	11- 50 & above (Mean 24)	04 (12)
3.	Major technology/services facilitated	
	Spice powder	12 (40)
	White pepper	03 (10)
	Bio-capsules of AIMO	04 (14)
	Coated spice seeds	04 (14)
	Fortified spice powders	07 (22)

entrepreneurship schemes. Maximum respondents (28 %) had obtained subsidised funding under Prime Minister's Employment Generation Programme (PMEGP) and was followed by 24 per cent of the entrepreneurs who got assistance under the Pradhan Mantri Mudra Yojana. The results indicated that around half of the entrepreneurs were beneficiaries of the schemes from 2016 to 2019. It could be inferred that the promotion of agribusiness activities by the Government in recent times has benefitted the entrepreneurs. The other popular schemes among the entrepreneurs were Entrepreneur Support Scheme (12%) and 24 per cent entrepreneurs had benefitted from otherschemes of state and centre. Another important factor that affected the economic feasibility of the enterprise was the number of workers employed in the enterprise. Most of the enterprises (72%) in the study had employed on an average onlythreeworkers and the employment capacityof the majority of enterprises ranged between 1 and 5. However, there were 16 and 12 per cent enterprises that employed an average workforce of 07 and 24, respectively.

The most common product manufactured by 40 per cent of the spice entrepreneurs were spice powders such aschilli powder, turmeric powder, and coriander powder. Also, niche market products such as white pepper (10%), bio-capsules of AIMO (14%), coated spice seeds (14%), and fortified spice powders (22%) were also in the product range.

Performance of spice powder enterprises

Performance analysis of any industry/firm/plant can be best used to understand the profitability and credit worthiness of the business. In turn it can be used to decide whether the enterprise is viable or not so as to decide whether to continue to exist in the business. As such, it help enterprises, especially those in their initial stages, to evolve appropriate strategies, decisions to address any deviations from the set targets. It was on this premise the performance of spice enterprises incubated through ICAR-IISR-ABI, Calicut was evaluated, and the results are presented in Table 5. The results in the table represent the details of the breakeven analysis of average data from spice enterprises involved with spice powder facilitated through the ABI. Average data of 19 enterprises involved in spice powder production (both ordinary and fortified) were used for the performance analysis. All the enterprises included in the study were started between 2013 – 2018 and had spice powders like turmeric powder and chilli powder as the major products. The enterprises had an average initial investment of ₹ 25,000 and these enterprises operated at an average unit production cost of ₹ 250/kg and marketed it at the average rate of ₹ 300/kg.

It could be observed from Fig.1 that the enterprises needed to produce and market on an average of 500 unitsproducts to enter the profitability zone. The average production cost to produce 500 kg was ₹ 1,50,000. It could be inferred from the results that

Table 5. Components of Break-Even Analysis of spice powder enterprises promoted by ICAR-IISR-ABI, Calicut

Production Units kg	Fixed cost [1]	Variable cost [1] (@250/kg)	Total cost [1]	Sales price [1] (@300/kg)
0	25,000	0	25000	0
100	25,000	25000	50000	30000
200	25,000	50000	75000	60000
300	25,000	75000	100000	90000
400	25,000	100000	125000	120000
500	25,000	125000	150000	150000
600	25,000	150000	175000	180000
700	25,000	175000	200000	210000
800	25,000	200000	225000	240000
900	25,000	225000	250000	270000
1000	25,000	250000	275000	300000

marketing of 500 units of output could fetch ₹1,50,000 of income which covers both fixed (₹25,000) cost and variable cost (₹125,000) and was the breakeven point for the spice powder enterprises.These results suggested that every unit needs to produce at least 500 units to cover the investments and enter the profitable zone.The spice powder enterprises in the study were producing on an average 570 units/month, it showed that the enterprises started to make profit from first month of their initiation itself. As the average production and sales of the selected product of all the selected enterprises was more than the calculated BEP, the enterprises were considered operational at profitable levels. Sharma et al. (2010) had obtained similar results in the study of the value chain of agro-processing industries in Himachal Pradesh, where the output of 42 spices units had led the venture into profit and profit earned was ₹ 3,64,612/year.

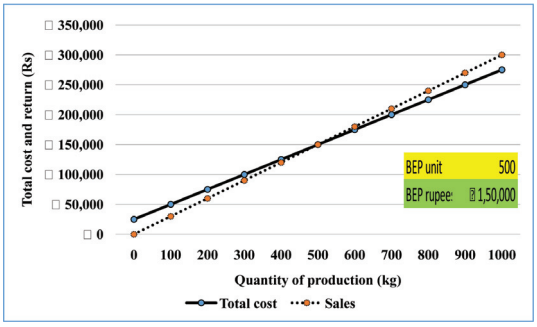

Figure 1. Break even analysis in spices powder enterprises

It was evident from the results that many of the prime technologies in spice production were directly transferred through the ABI to entrepreneurs in the state. It implied that the spice powder entrepreneurs who completed the business incubation program at ICAR-IISR-ABI, Calicut had a greater success rate in their business irrespective of the business size. This could be attributed to their greater access to technologies and entrepreneurship development programmes under the ABI. The relatively small size of BEP confirmed the feasibility of spice powder technology for small and micro-enterprises. Thus, it could be concluded from the results that the promotion of innovations related to agro-processing industries under public policy that favour ABI Centres in India was well demonstrated by the ICAR-IISR-ABI, Calicut. As such, the results hold policy implications in promoting ABIs as technology facilitators in entrepreneurship development in agriculture. Moreover, the ABI supported units could realise profit in a short period was also remarkable. Therefore, a more detailed analysis comparing different production units with more diverse products utilizing different technologies under ABI would be beneficial to provide guidelines to improve ABI strategies and policy guidelines.

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