

Performance Analysis of Agri-enterprises Facilitated through KAU-Agri Business Incubators

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Authors' contributions

This work was carried out in collaboration among all authors. Author BT performed the sampling and statistical analysis and wrote the first draft of the manuscript. Author KPS guided the first author and corrected the manuscript. Author BPB guided in identifying the variables for the analysis and reviewed the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Vocal for local' the slogan for Atma Nirbhar Bharat Abhiyan accentuate self reliance by bringing the local products to the global arena. Indian agrarian sector provide huge scope for demand driven agricultural research in this context. Agri Business Incubation centres institutionalised by ICAR envisage product development, promulgation of IP protection and technology commercialisation. Each of these centres focus to reinforce the linkage between the research institutes and industries in their mandated areas. Accordingly, the network of Agri Business Incubators(ABI) established by Kerala Agricultural University (KAU) covers diverse crops under the agriculture sector with special emphasis on value addition and market linkage. The present paper depicts the agribusiness ecosystem of Kerala in general and the role of KAU-ABI in reviving the ecosystem in particular. The beneficiaries who were facilitated through KAU-ABI during 2017-2020 were selected for the analysis. Primary and secondary data were collected and ex-post facto research design based on purposive

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sampling was followed. Performance indicators such as preference for training, extent of support received, transfer of technology, legitimisation and upgradation of the enterprises were selected for the analysis. The results indicated that KAU-ABI strengthened the linkage between entrepreneurs, various facilitators and key investors in the entrepreneurial ecosystem. It also created entry points in the agricultural value chains to accelerate economic growth for the agripreneurs.

Keywords: Agripreneurship; ecosystem; agribusiness incubation; preference index; technology transfer.

1. INTRODUCTION

India with its rich biodiversity, multiple agro-climatic zones, extensive arable land and diversified agriculture ranks 2nd largest producer of cereals, fruits and vegetables; and highest producer of pulses. With a view to uplift the Indian economy amidst the pandemic, Hon'ble Prime Minister announced 'Atma Nirbhar Bharat Abhiyaan' emphasising self reliance and COVID relief packages [1]. Hence it is pertinent to ameliorate indigenous technologies, local manufacturing and local supply chain to make our products globally competent with special emphasis for attracting the youth. These gave credentials to the concept of agribusiness incubation in the agripreneurship development in the country. The wide array of commercial activities both on farms as well as off farms helps to revive the livelihood options for better income and employment opportunities. Agripreneurship is considered as the progressive journey of introducing novel approaches and practices for better productivity and income generation for the farming community [2].

Business incubation as a model of capacity building for entrepreneurship render interaction among the key players in the entrepreneurial ecosystem, which is pertinent for the business ventures to develop as matured enterprises [3]. Business incubators are considered as policy instruments in the growth of the country. According to Phan et al. [4], Business Incubators are the intermediate organisations envisaged to transform technical business idea into an efficient enterprise by facilitating conducive entrepreneurship environment, technological and organisational resources and facility to interact with managerial experts.

With the rapidly changing market demand and shorter product life cycle due to technological obsolescence, incubators were established as a global phenomenon to leverage resources for technology based ventures. Smilor reported that

the key benefits offered by the incubators to its tenant companies in most of the countries can be generalised as fostering credibility, shorten the learning curve, solve the problems faster and facilitate entrepreneurial network [5].

Barbero analysed the performance of the archetypal incubators in Spain under four categories -basic research incubators, university business incubators, economic development incubators and private incubators [6]. The performance indicators selected for the analysis were sales growth, employment growth, participation in European R&D programmes, gross investment in R&D, new products and services introduced, intellectual property rights claimed, etc.

Bergek and Norman correlated the incubator performance with the extent to which the outcome corresponds to the goals of the incubator. A framework for identifying best practise incubator models were developed in terms of model components namely selection, infrastructure, business support, mediation and graduation [7]. As per the analysis of Tengeh and Choto [8] 55.1% of the survivalist entrepreneurs enrolled in incubation programs of South Africa acquired access to business networks, finance, and other institutional facilities. It was also reported that 57.1% of the incubators addressed financial challenges to offer quality support to the survivalist entrepreneurs. Hence, it is imperative to establish proper support mechanism to attain perceived mandate.

The success of an incubation program is dependent on the quality of the entrepreneurs incubated such as motivation, competency, willingness to learn, determination to succeed, and their courage to face risks [9]. Morant and Oghazi opined that entrepreneurs with university studies are found to be adventurous, enthusiastic, and energetic. University qualification and professional experience nurture the entrepreneurs to make better decisions and

enable them to resolve conflicts that arise when creating a business [10].

In India, Agri-Business Incubation program of 2003, a joint initiative of the International Crops Research Institute for Semi-Arid Tropics (ICRISAT) and Department of Science and Technology (DST), Government of India (GoI) institutionalised ABI [11]. Subsequently, Indian Council of Agricultural Research (ICAR) established Agri Business Incubation Centres in agriculture research institutes and State Agricultural Universities (SAU) under its National Agricultural Innovation Project [12,13]. Agri Business Incubator (ABI) acts as a catalyst for transforming the budding agribusiness ideas or early stage ventures into feasible technology based products or services through scaling up [14].

The formulation of Science, Technology and Innovation Policy (2013) and National Intellectual Property Rights Policy (2016) advocate establishment of an innovation-led entrepreneurship ecosystem. Further, the launching of initiatives such as Make in India (2014), Start up India (2015), Digital India (2015), Stand up India (2016), Atal Innovation Mission, ASPIRE Scheme, PMFME- Prime Ministers Scheme for Formalisation of Micro Food Processing Enterprises (2020) aimed to uplift India as a global manufacturing hub accelerated the growth of the ecosystem [15].

Being the first State to framework Startup policy (2014), Kerala could pioneer the Indian startup ecosystem and bring out vicissitude in incubation. Kerala was selected as 'Top performer for developing ecosystem' and the Leader across all pillars of the startup ecosystem' as per the 'States Startup ranking-2019' of Government of India. As per the Kerala Startup Ecosystem Report- 2019, Startups focussing on innovative products total to 2200+ and the IT services form the top sector (28%) whereas agriculture sector prominence is only 3% [16].

The network of Agri Business incubators established by Kerala Agricultural University are spread across the state, headed at KAU main campus Vellanikkara and sub-centres at KCAET Tavanur, College of Agriculture, Vellayani, RARS Piliicode, KVK's, Regional research stations, etc. Being the pioneer institution in agriculture and allied sectors, KAU was selected for implementing national level schemes- Rashtriya Krishi Vikas Yojana - Remunerative Approaches

for Agriculture and Allied Sector Rejuvenation (RKVY-RAFTAAR), MSME- A Scheme For Promotion of Innovation, Rural Industry & Entrepreneurship (ASPIRE), One District-One Product (ODOP) programme under PMFME. The transfer of technology from research institutions play an integral part to support an enabling agripreneurship development environment [17]. Hence, it is pertinent to ensure outreach of the frontier technologies to the public domain which in turn will have far reaching effect in empowering the ecosystem. Programmes and services with special emphasis to promote innovation and value addition can render prospects for farmers to take their harvests and technologies to a comprehensive market place [18].

Sudheer et al. [19] validated the agripreneurial ecosystem in Kerala as a measure of institutional support and related incentives, incubation infrastructure, capacity building programs, technology transfer and consultancy. The wide array of services rendered by KAU-ABI played a significant role in translating the early stage idea/ventures into viable prototype/ product. KAU- ABI has developed many innovative process protocols and food processing machineries to cater the needs of emerging food processing sector [20]. KAU-ABI also provides entrepreneur support to several food processing industries and encourages marketing of traditional products from locally available agricultural produces.

The present study was carried out to analyse the performance of the enterprises facilitated through KAU-ABI.

2. METHODOLOGY

Ex-post facto research design was followed in the study [21] and purposive sampling was selected to collect the primary data from the clients of KAU-ABI [22]. Questionnaire was prepared for data collection and it was further modified based on the pretest carried out.

Sample size was fixed as 100, which consists of the beneficiaries who have availed services from KAU-ABI during the period 2017-2020. The details of the beneficiaries were collected from the ABI of Kerala Agricultural University functioning at Vellanikkara campus, Thrissur, Kerala. The beneficiaries include entrepreneurs/incubatees, researchers, participants of capacity building programmes, entrepreneurship development programmes, product analysis, etc.

Structured interview schedule was employed for the analysis. The research questionnaire consists of the following sections- general information of the respondents, profile of the respondents, preferences for training programmes, response on extent of support received, transfer of technology, legitimisation and upgradation of the enterprises. The variables selected for the study and the scores assigned based on the scales are shown in Table-1. Scores 1, 2, 3 indicate the most negative to the most positive degree of opinion, as per Likert scale.

Preference index of training programmes organised by KAU-ABI was determined as follows.

$$\text{Preference Index} = \frac{\text{Total Score}}{\text{Maximum Score}} \times 100$$

The profile characteristics of the beneficiaries were quantified. Classification, tabulation and analysis of the data were done based on statistical techniques such as arithmetic mean, average, frequency, etc.

Table 1. Details of variables and scores assigned for the study

Sl. No.	Variables	Scale	Score
1.	Preference of participants for training i) Food Preservation ii) Value addition in food processing iii) Food Safety and Quality management iv) Entrepreneurship Development Training v) Building IP portfolios in Food processing	Three point scale	Highly preferred (3) Preferred(2) Not preferred(1)
2.	Extent of facilities rendered by KAU-ABI i. Guidance ii. Facilities for Technology development iii. Facilities for Product analysis iv. KAU-ABI Team support v. Access to KAU-ABI	Three point scale	Excellent(3) Good(2) Fair(1)
3.	Transfer of Technology from KAU-ABI i. How do you rate the technology ii. Adaptability of the technology	Three point scale	Excellent(3) Good(2) Fair(1)
4.	Legitimisation through KAU-ABI i. Awareness on new policy initiatives ii. Networking with mentors and key players iii. Interaction with technical experts iv. Access to credit support v. Social networking	Two point scale	Yes(2), No (1)
1.	Upgradation of enterprises supported through KAU-ABI i. Initial status of firm-- Nascent/ Young ii. Did you receive technical support iii. Did you receive financial support iv. Is your firm upgraded to Private company, LLG, JLG, etc.	Two point scale	Yes(2), No (1)

3. RESULTS AND DISCUSSION

The analysis of beneficiaries facilitated through KAU-ABI is as follows:

3.1 Spectrum of Beneficiaries

The beneficiaries facilitated through KAU-ABI were categorised as entrepreneurs, farmers, Women Self Help Group (SHG) members, researchers, processing units, etc.

The distribution of the beneficiaries is presented in Fig.1 and the majority were found to be entrepreneurs (68%).

Fig. 2 presents the categorisation of the beneficiaries into three groups, based on their age. It is vivid that 49 % of the beneficiaries were middle age group(35-50 years), followed by young age (<35 years) and seniors (>50 years)group. These results were in line with the findings of Mian [23]. The youngsters and middle age group have strong desire and motivation to venture in new domains, as reported by Wagner and Sternberg [24].

The distribution of the beneficiaries based on educational profile is presented in Fig.3. The majority of the beneficiaries are PhD/ post graduates/graduates in engineering/ science/business fields.

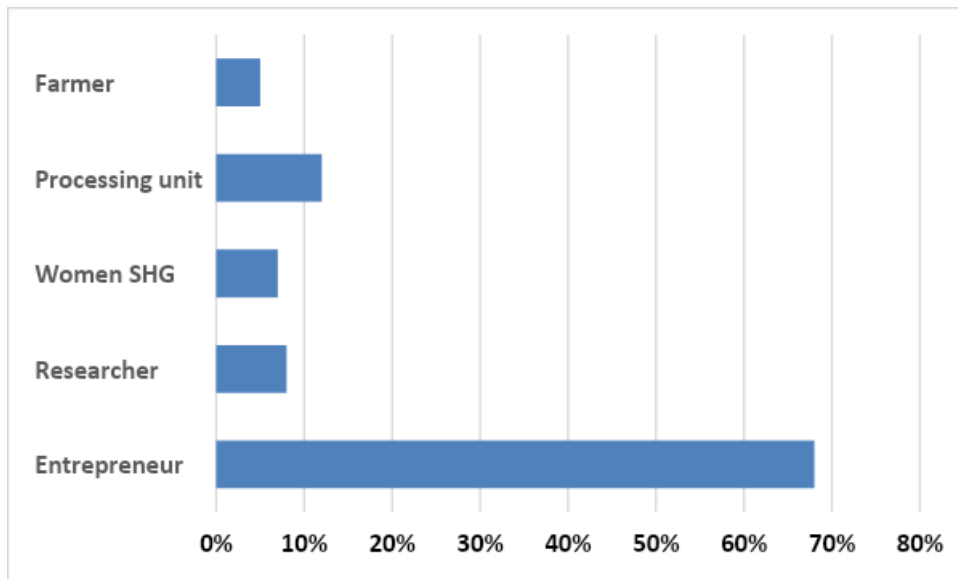


Fig. 1. Different categories of ABI beneficiaries

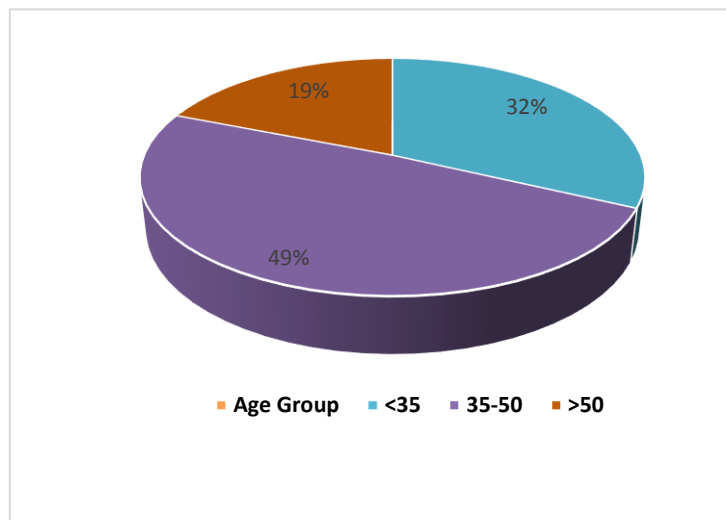


Fig. 2. Distribution of beneficiaries based on age

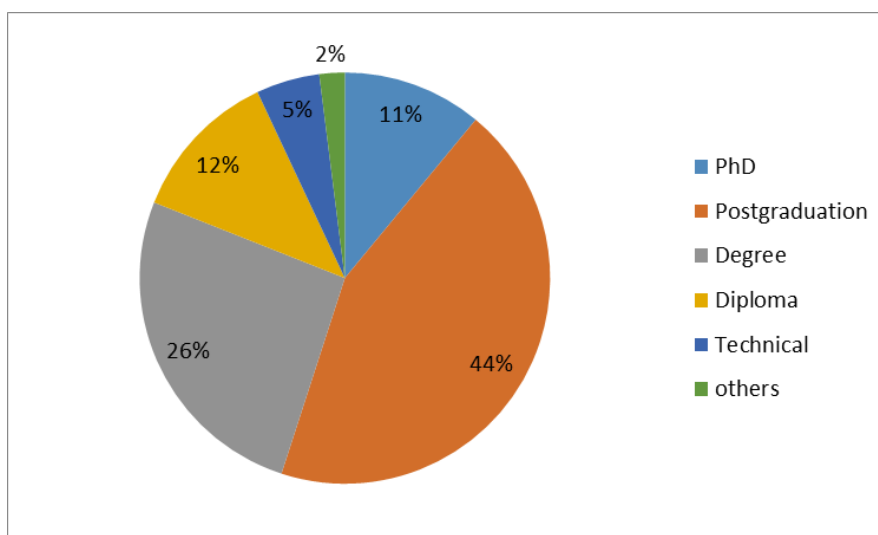


Fig. 3. Educational profile of ABI beneficiaries

The expertise of the beneficiaries in interdisciplinary fields and their passion and drive enabled them to gear up to venture in the new domains of the career. The higher education and professional exposure mould the youngsters to be receptive, enthusiastic and energetic. This trend is in harmony with the findings of Morante and Oghazi [10].

3.2 Preferred Areas for Training

Table-2 presents the distribution of participants against each training programme organised by KAU-ABI. Based on the preference of the participants for attending training programmes, preference index was calculated as explained in methodology. The results are presented in two levels, Level-1 and Level-2 with highest and second highest levels of the participants respectively. Further, the preference index values were categorised into three groups, as shown in Table 3.

The distribution of respondents based on their preference to attend the training programmes considering all five trainings are shown in Table-3. Majority of the beneficiaries had high level of preference for training programmes on food preservation, value addition, food safety and quality control.

3.3 Fostering Enterprises through Need Based Technologies

Incubatees who had graduated from the KAU-ABI and RAFTAR-ABI could succeed in adoption of novel technologies for development of innovative products/ prototype and scalable machineries for values addition. High end technologies and versatile equipments in the KAU-ABI facilitates commercial production at the incubation centre, without investing huge amount for setting up or duplicating own infrastructure. The response of the entrepreneurs on the extent of facilities rendered by KAU-ABI is shown in Fig.4.

Table 2. Preference of beneficiaries on training programmes of KAU-ABI

Sl. No.	Training Programme	Distribution of participants	
		Level- 1	Level- 2
1.	Food Preservation	76(H)	24(M)
2.	Value addition in food processing	72(H)	28(M)
3.	Food Safety and Quality management	78(H)	22(M)
4.	Entrepreneurship Development Training	74(H)	21(M)
5.	Building IP portfolios in Food processing	63(H)	25(M)

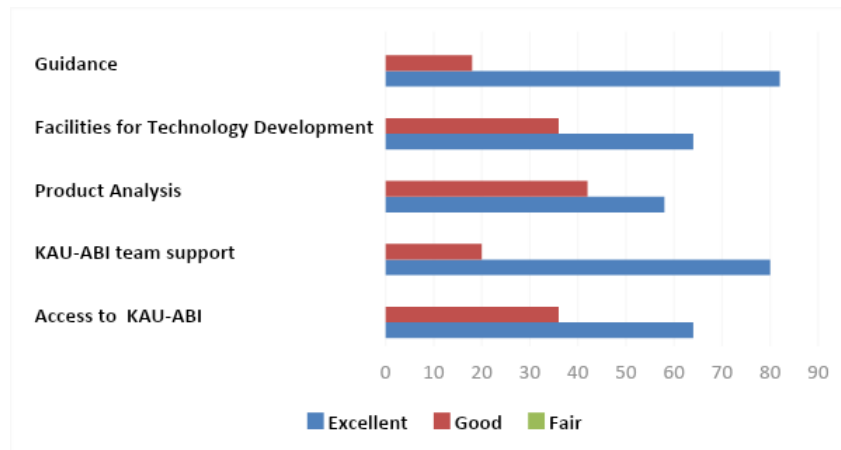


Fig. 4. Response of the entrepreneurs on the facilities rendered by KAU-ABI

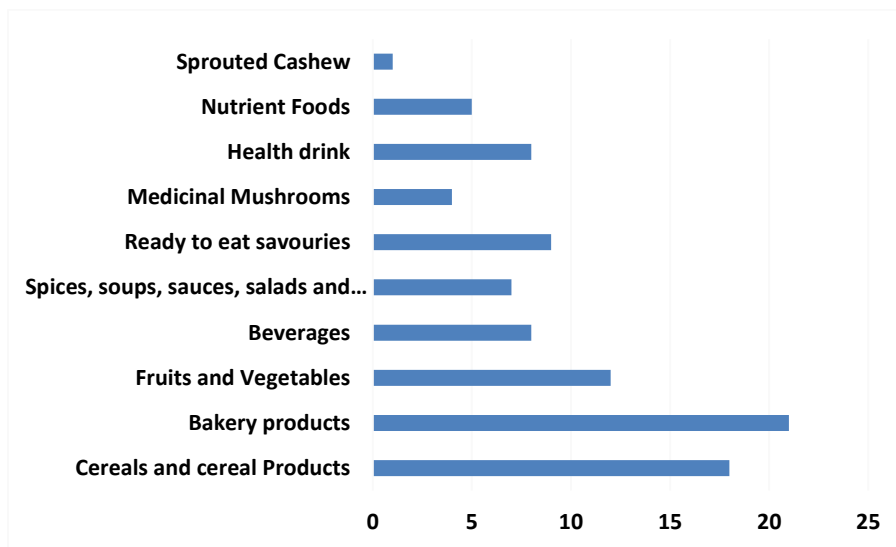


Fig. 5. Diversity in the product profile of ABI entrepreneurs

Table 3. Distribution of beneficiaries according to their preferences for training (n=100)

Preference index (%)	Levels	Distribution of respondents (%)
0-32	Low	3.4
33-66	Medium	24
67-100	High	72.6

The spectrum of products/ technologies developed by the entrepreneurs with the support of KAU-ABI are shown in Fig. 5.

3.4 Legitimation

The efforts of KAU-ABI in collaboration with Ministry of Micro Small and Medium

Enterprises (MSME), District Industries Centres (DIC) and Kerala Start Up Mission (KSUM) were effectual in familiarising the entrepreneurs with the new policy initiatives of government. It also accelerated business development activities, interaction with the leading mentors for knowledge sharing. Fig. 6 depicts the response of the beneficiaries on the legitimisation in the agribusiness ecosystem.

The legitimisation has helped them to establish tie up with financial institutions and venture capitalists. Based on the data collected, 70 % of the entrepreneurs could succeed to avail financial support from various government schemes. Around 25% entrepreneurs availed credit support from Mudra Scheme, loan from nationalised banks, and other private partners.

3.5 Upgradation of Enterprises

Feasible project proposals from incubates for seed stage funding are identified under agripreneurship orientation programme and startup incubation programme. The incubatees who had successfully undergone orientation programmes of RAFTAR-ABI were selected for financial support for prototype development and further scaling up. As per the data collected, at the time of collaboration with KAU-ABI, the enterprises were mostly young (64.7%) or

nascent (29.4%). Later, based on the technical support and mobilization of resources through the orientation programmes, these ventures were upgraded into established firms such as private company, partnership company, joint liability group and limited liability group.

The transformation of enterprises from its nascent/young stage to the current status is indicated in Fig. 7 which in turn reflects the presence of a conducive agripreneurial ecosystem in the State.



Fig. 6. Response of the entrepreneurs on legitimisation

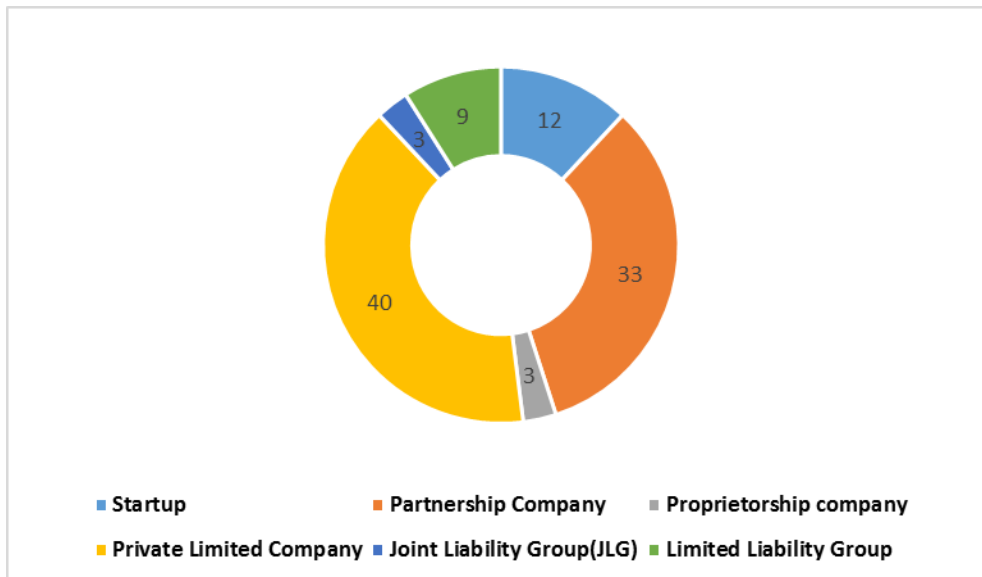


Fig. 7. Distribution of KAU-ABI promoted enterprises

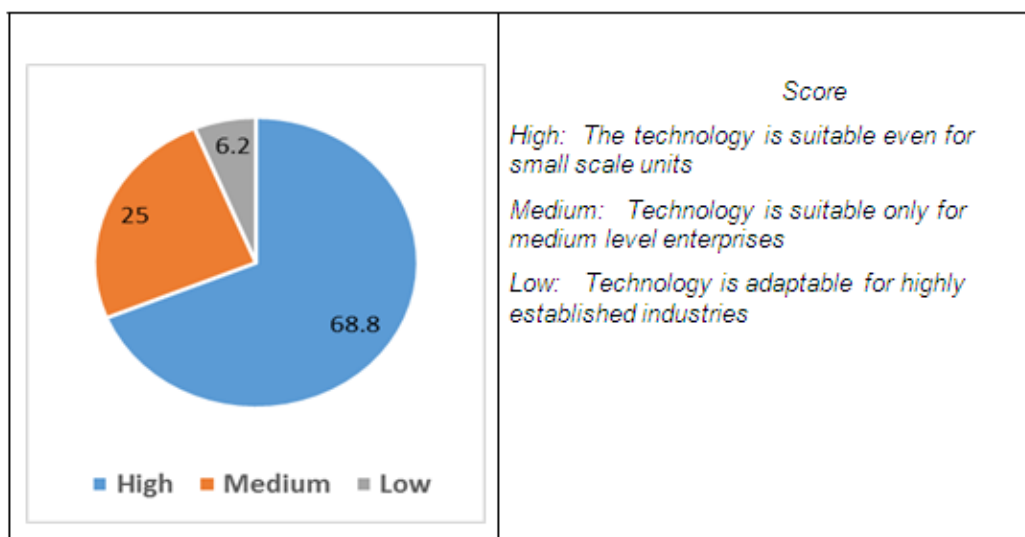


Fig. 8. Projection of Scale readiness levels of technologies from KAU

3.6 Scale Readiness Levels

KAU introduced scale readiness levels in order to assess the feasibility and adaptability of a particular technology from the perspective of the end users. As shown in Fig.8, 68.8% of the beneficiaries opined that the scale readiness level is high which indicates that the technology is adaptable even for the small scale units.

Technology driven services availed on need basis were found to be excellent and as per the data collected, 88% of the entrepreneurs responded that no further modifications were required at the user end which indicate the success of the transfer of technologies from KAU- ABI. The results show promising statistics of technology infiltration and impact of capacity building initiatives within the agribusiness spectra of the state.

4. CONCLUSION

Agribusiness incubators function as a powerful tool to hasten entrepreneurship development and generate remunerative prices for the farmers. KAU-ABI strengthened the linkage between entrepreneurs, various facilitators and key investors in the entrepreneurial ecosystem. It also facilitated capacity building of entrepreneurs to fulfill their dreams and to initiate new ventures for employment generation and profitability.

In the present study, the profile characteristics of the beneficiaries who have availed services from KAU-ABI during 2017-2020 were quantified and out of this, 68 % were entrepreneurs. Majority of the beneficiaries represented middle age group followed by youngsters with higher professional/ technical education. The results indicated high preference index for the training programmes on food preservation, value addition and food safety and quality control.

Moreover, the enterprises initially in the nascent/ young stage had excellent legitimisation and adequate access to financial resources which enabled its upgradation into private company, partnership company, limited liability group, etc.

Literature on the performance of enterprises especially on the technology perspective was limited. Certain beneficiaries were reluctant to join this initiative and to share their details. However, the diversity in the product profile of the entrepreneurs indicated that the hands on training programmes, the high end technologies and versatile equipments in the KAU-ABI facilitated commercial production at the incubation centre. The results iterate that KAU-ABI being technology driven and knowledge driven entity played a vital role in nurturing the agribusiness ecosystem of the State and it is pertinent to pursue the initiatives of ABI to assure sustainable livelihood for the beneficiaries.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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