

RESEARCH ARTICLE



# Secondary Agriculture: cognizance of faculty and students of University of Agricultural Sciences, Bangalore

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## Abstract

Secondary Agriculture in recent days has alluring the concentration of all the stakeholders in Agriculture. Even though, word secondary agriculture looks familiar, the meaning of that word is vague. The present study was to analyse the awareness and attitude of Faculty and Students about secondary agriculture in university of Agricultural sciences, Bangalore during 2023-24. The structured questionnaires' was used to collect the primary data; ninety samples were considered for the study consisting of thirty faculty, thirty post graduate students and thirty undergraduate students. It was evident that more than half of the respondents possessed medium awareness (55.55 %) about secondary agriculture followed by low (28.88%) and high (15.55 %) awareness. But less number of respondents were had correct knowledge (20.00 %) regarding secondary agriculture. About 37.78 per cent of respondents belonged to high attitude category followed by medium (34.44 %) and low (27.78 %) attitude towards secondary agriculture. Attitude statement Secondary agriculture helps in employment generation across India ranked first with mean score of 4.23 and Rural industrialization helps in creating linkage between primary and secondary agriculture (Rank II = 4.12). The major constraints expressed in promoting secondary agriculture were Inconsistent supply of raw materials (Relative Importance Index = 0.853), Lack of farmer's awareness regarding secondary agriculture and requires technical expertise (Relative Importance Index = 0.820). But according to findings of study, more than half of the respondents had awareness about secondary agriculture whereas only twenty per cent of the respondents possessed correct knowledge regarding secondary agriculture. In under graduation a course can be included for undergraduate students and HRD programmes can be acquainted to faculties of Agricultural sciences. In under graduation a course can be included for undergraduate students and HRD programmes can be acquainted to faculties of Agricultural sciences..

**Keyword:** Knowledge, Attitude, Awareness and Secondary Agriculture

## Introduction

Agriculture has been historically thought as primary sector, contributing to economic development of nation. Agriculture and related industries will still be a focus of the economy, both from the perspective of meeting the nutritional and food security needs of the population, as well as from the perspective of providing employment for fifty per cent of the population. In addition to the traditional modalities of primary production in agriculture and related industries, more attention needs to be paid to other ways of providing rural households with work and income. (Ramesh Chand *et al.*, 2017). The agricultural production needs to be integrated with the manufacturing sector, where it is transformed into a consumable product, or marketing services, which can be monetized as a produce by adding economic value and nutritional security to the farmers which can be possible through secondary agriculture.

Secondary agriculture is defined as processing and adding value to the basic agriculture commodities (O'Shea *et al.*, 2012). Secondary Agriculture in recent days has alluring the concentration of all the stakeholders in Agriculture. The society has fascinatedly using the word secondary agriculture to revamping the nutritional and economic security of farmers.

Even though, word secondary agriculture looks familiar, the meaning of that word is vague. Secondary Agriculture includes all methods and procedures involve the application of effective technology, Market expertise and customer preferences to increase the value of agricultural products. Secondary agriculture takes precedence with the proclamation of the goal of doubling farmers' incomes. The term 'secondary' has an influence on climate change adaptation and mitigation, small farmer profitability and feasibility, food stability, nutrition, the productive use of natural resources, and the optimum utilisation of primary agricultural products and farm earnings.

According to the Economic Accounts for Agriculture of the European Union, a Technical Advisory Committee on Secondary Agriculture was established by the then-Planning Commission in 2007. The committee had established the inclusion criteria as "assembling, ripening, cleaning, grading, sorting, drying, preserving, packing and storing," despite the fact that there is no formal definition of secondary agriculture (Desh Pal S. Verma., 2008).

When the Ashok Dalwai Committee released its report in February 2018 on "adding value to primary agriculture and building agricultural enterprises in rural India" through "farm-linked activities and secondary agriculture," the notion of secondary agriculture was understood and it made reference to "farm-related activities and secondary agriculture". (Anonymous, 2018)

Secondary agriculture is anticipated to turn underutilised resource into a source of revenue. It is important to encourage farm-related economic activities in close proximity to farms, especially those that are quick to set up, quick to reproduce, and easy to service. (Chengappa, 2013). When building businesses or services at the village level, the idea of "simple, replicable, and serviceable" methods should be kept in the forefront. This will

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also aid in ensuring that the increase of non-farm earnings is inextricably tied to, enhances, and supports the on-farm incomes of the community. By understanding the importance and need of secondary agriculture, the present study has been conceptualised to analyse the awareness, attitude and knowledge about secondary agriculture. Knowledge and attitude of scientists and agricultural graduates is most significant in dissemination of accurate information and knowledge to farming community to promote secondary agriculture. Borg and Gall (1989) noted that attitudes generally consist of three components: affective (an individual's feelings about the attitude object); cognitive (an individual's beliefs or knowledge about the attitude object); and behavioural (an individual's predisposition to act toward the attitude object in a particular way)

### Methodology

The accessible population for this descriptive study was undergraduate, post graduate students and faculty of university of Agricultural Sciences, Bangalore (n=90). Students and faculty from agricultural background, has provided greatest representation regarding secondary agriculture. Researcher treated all the students and teachers of university of agricultural sciences as possible samples and questionnaire was sent to faculty through email and to students through WhatsApp groups. Thirty faculties were responded, thirty Post Graduate students were responded the questionnaire and forty-three were Under Graduate students filled their responses among them thirteen were incomplete. So only thirty samples of undergraduate students were considered as respondents for the study along with faculties (n<sub>1</sub>=30) and Post Graduate (n<sub>2</sub>=30) students.

The research instrument was developed based on review of literature and guidance of experts in the discipline of agricultural extension and allied disciplines. Awareness of faculty and students about secondary agriculture was measured using items developed (11 items, Cronbach alpha = 0.941); students and faculty responded on Likert scale of five-point continuum (Strongly Agree = 5, Agree = 4, Undecided = 3, Disagree = 2 and Strongly Disagree = 1).

To Measure the open knowledge level of faculty and students, open ended questions were used and correct answers were given the score of 1 and 0 for incorrect answers.

Attitude of the faculty and students towards secondary agricultural were measure using (17 items, Cronbach alpha = 0.921), respondents rated their agreement levels on five-point continuum (Strongly Agree = 5, Agree = 4, Undecided = 3, Disagree = 2 and Strongly Disagree = 1).

Constraints in promoting secondary agriculture were measure using 11 items and were analysed using Relative Importance Index. Data were analysed using descriptive statistics.

Relative Importance Index is calculated for each of the indicators and ranked accordingly. The RII derived to summarize the importance of each indicator:

$$RII = \frac{\sum W}{AN} = \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n_1}{5N}$$

Where,

W= Weighting as assigned on Likert's scale by each respondent in a range from 1 to 5, where 1 = Strongly disagree, 2 = Disagree, 3 = Undecided, 4 = Agree and 5 = Strongly Agree

A = Highest weight (here it is 5)

N = Total number in the sample.

The Kruskal-Wallis H test is a non-parametric one-way ANOVA on ranks used for testing whether samples originate from the same distribution. It was used in the study for comparing more than two independent samples of equal or different sample sizes. Kruskal-Wallis H test was applied to test the hypothesis that there is a significant difference between awareness and attitude of undergraduate, postgraduate students and faculty of university of Agricultural sciences, Bangalore.

### Results and discussion

#### Awareness of faculty and students towards secondary Agriculture

In this section, respondents rated their awareness for statements measuring awareness about secondary agriculture. Respondents agreed most with the statements that tapping environment friendly source of fuel can provide additional income to farming community ( $M = 4.238$ ), value addition to primary agriculture production system is considered as secondary agriculture ( $M = 4.326$ ) and secondary agriculture considers agriculture as an enterprise ( $M = 4.322$ ). The respondents agreed least with the statements that Non-farm agricultural activities are not considered as secondary agriculture ( $M = 2.885$ ), Type B is associated with rural-off farm activities ( $M = 1.024$ ) and Type C strives on crop residues or by products of primary agriculture ( $M = 1.067$ ). (Table 1)

#### Overall awareness of respondents towards secondary agriculture

Based on frequency and percentage awareness level of respondents were categories as low medium and high category. It is evident from the Table 2 that more than half of the respondents possessed medium awareness (55.55 %) about secondary agriculture followed by low (28.88%) and high (15.55 %) awareness.

#### Attitude of Faculty and students towards secondary agriculture

On an average only twenty percent of the respondents possessed correct knowledge regarding secondary Agriculture. Slightly more than two-fifth (41.11 %) of the respondents were aware about avenues of secondary agriculture and alternative enterprises to be considered as secondary agriculture. Equal number of respondents (11.11 %) possessed correct knowledge regarding classification of avenues and Government initiatives on secondary Agriculture. Only 18.89 per cent of respondents possessed correct knowledge about the institution working on secondary Agriculture in India. Meager percent of respondents possessed correct knowledge about full of TACSA (7.78 %) and Under which ministry directorate of secondary agriculture is working (8.89). (Table 3)

#### Attitude of Faculty and students towards secondary agriculture

As seen in Table 4, according to the attitude questionnaire, respondents rated their level of agreement for statement Secondary agriculture helps in employment generation across India ( $M = 4.23$ ) is high followed by rural industrialization helps in creating linkage between primary and secondary agriculture ( $M = 4.21$ ) and secondary agriculture helps in creation of marketing opportunities for end products of primary agriculture ( $M = 4.20$ ). The item with the lowest arithmetic mean was determined to be Secondary agriculture requires more capital outlay ( $M = 3.74$ ) and secondary agriculture is only for resource rich & progressive farmer ( $M = 3.10$ ). The findings are in conformity with Wingenbach *et al.*, 2013.

#### Overall attitude of respondents towards secondary agriculture

Based on frequency and percentage attitude level of respondents were categories as low medium and high category. Analysis of attitude of respondents yielded that more than one third of the respondents belonged to high attitude (37.78 %) category followed by medium (34.44 %) and low (27.78 %) attitude towards secondary agriculture.

#### Comparative analysis of awareness and attitude of faculty and students towards secondary Agriculture

The results of the Kruskal-Wallis one-way ANOVA inferred that there was no statistically significant difference was found

with respect to awareness of faculty (*Mean rank = 41.47*), Post graduate students (*Mean rank = 50.97*) and undergraduate students (*Mean rank = 44.07*) respectively as mentioned in Table 6.

For comparing the differences in attitude of Faculty, Post graduate students and under graduate students Kruskal-Wallis one-way ANOVA was applied and found that there were no statistical significant differences exist among faculty (*Mean rank = 45.40*), Post graduate students (*Mean rank = 48.50*) and undergraduate students (*Mean rank = 42.60*) with respect to attitude.

### Constraints in promoting Secondary Agriculture

Constraints in promoting secondary agriculture ranked by respondents were analysed Using Relative Important Index. Relatively important constraints expressed by respondents were Inconsistent supply of raw materials (*RII=0.853*), Lack of farmer's awareness regarding secondary agriculture and it requires technical expertise to practice secondary agriculture (*RII=0.853*). Least Important constraints expressed were high investment cost (*RII = 0.760*) and lack of government initiatives on secondary agriculture and Linking primary agriculture to secondary agriculture is difficult task (*RII= 0.767*).

Secondary agriculture helps in using all parts of an agricultural produce, processing to enhance shelf life, increasing total factor productivity, and generating additional jobs and income for farmers. But according to findings of study, more than half of the respondents had awareness about secondary agriculture whereas only twenty per cent of the respondents possessed correct knowledge regarding secondary agriculture. In this regard there is a need to enhance the knowledge of the faculty and students, who plays a major role in disseminating in-depth knowledge to the farming community in general and about secondary agriculture in particular. In under graduation (B.Sc., Hons. Agriculture) a course can be included for undergraduate students in the course curriculum and HRD programmes can be acquainted to faculties of Agricultural sciences in order to enhance knowledge of faculties.

The study was confined to only University of Agricultural Sciences, Bangalore. So, similar studies can be made as comparative evaluation of cognizance among faculties from different Agricultural universities across India.

Comparative analysis of economic performance, profitability and sustainability of farmers practicing secondary Agriculture can be undertaken to eyewitness the differences among farmers practicing agriculture as well as secondary agriculture.

Even though study included students and faculty, the efforts can be made to study the farmers' cognizance and attitude towards practicing secondary agriculture for economic profitability and environmental sustainability can be take on oneself for the study.

**Table 1. Awareness of faculty and students towards secondary Agriculture**

n = 90			
Sl. No	Statements	Mean	SD
	Secondary Agriculture considers agriculture as an enterprise	4.322	0.696
	Secondary Agriculture does not utilize raw materials of primary agriculture	2.789	1.197
	Any activity on the farm that is beyond Kharif, rabi & Zaid season is considered as secondary agriculture	3.753	1.009
	Non-farm agricultural activities are not considered as secondary agriculture	2.885	1.098
	Value addition to primary agriculture production system is considered as secondary agriculture	4.326	0.818

Type A can be achieved by improving livelihood improvement action plan	4.366	0.482
Type B is associated with rural-off farm activities	1.024	0.796
Type C strives on crop residues or by products of primary agriculture	1.061	0.860
Innovations in the field of postharvest technology of medicinal & aromatic plants can be considered as secondary agriculture	4.253	0.637
Minor millet based value added products enhances profitability to the farmers	4.250	0.738
Tapping environment friendly source of fuel can provide additional income to farming community is considered as secondary Agriculture	4.238	0.734

**Table 2. Overall awareness of respondents towards secondary agriculture**

n=90			
Awareness	Category	No	%
Mean = 40.92 SD = 7.81	Low (<37.01)	14	15.55
	Medium (37.01 – 44.83)	50	55.55
	High (> 44.83 )	26	28.89

**Table 3. Knowledge level of respondents towards secondary Agriculture**

n=90		
Sl. No	Questions	Correct Responses
1	What are the avenues for secondary Agriculture?	37 (41.11)
2	Classification of avenues of secondary agriculture	10 (11.11)
3	Which are the alternative enterprises to be considered as secondary agriculture?	37 (41.11)
4	Which Institute is working on secondary Agriculture in India	17 (18.89)
5	Full form of TACSA	7 (7.78)
6	Government Initiatives on secondary agriculture	10 (11.11)
7	Under which ministry directorate of secondary Agriculture is working?	8 (8.89)

Responses are mutually exclusive

**Table 4. Attitude of Faculty and students towards secondary agriculture**

n = 90			
Sl. No	Statements	Mean	SD
	Secondary agriculture focuses on the crop residues & waste material of primary agriculture	4.02	0.93
	Secondary agriculture has potential to increase or double the farmer's income	4.16	0.79
	Secondary agriculture requires more capital outlay	3.74	1.03
	Secondary agriculture requires skill & expertise to practice secondary agriculture	3.96	0.83
	secondary agriculture is only for resource rich & progressive farmer	3.10	1.18
	Rural industrialization helps in creating linkage between primary and secondary agriculture	4.21	0.85
	Secondary agriculture helps in waste minimization	4.07	0.90
	Secondary agriculture helps in employment generation across India	4.23	0.82
	Increased preference for value added products favoured the growth of secondary agriculture	4.14	0.88
	Secondary agriculture helps in creation of	4.20	0.79

marketing opportunities for end products of primary agriculture		
Secondary agriculture has untapped potential for increasing income of farmers	4.17	0.78
Secondary agriculture is favoured by the growth of organized retail market	3.91	0.95
Secondary agriculture helps promotion of under-utilized by products of agriculture as well as creates a demand for value added products	4.10	0.87
Secondary agricultural products require world class packaging & branding to attract the consumers	3.93	0.99
Overall secondary agriculture contributes to Sustainable development of Nation	4.12	0.85
Secondary agriculture has a bearing on climate change and mitigation	3.94	0.83
Financial literacy and marketing skills are essential for practicing secondary agriculture	3.96	0.92

**Table 5. Overall attitude of respondents towards secondary agriculture**

n = 90			
<b>Awareness</b>	<b>Category</b>	<b>No</b>	<b>%</b>
<b>Mean = 67.96</b> <b>SD = 10.25</b>	Low (<62.84)	31	34.44
	Medium (62.84 – 72.08)	34	37.78
	High (> 72.08)	25	27.78

**Table 6. Comparative analysis of awareness and attitude of faculty and students towards secondary Agriculture**

n = 90					
Sl. No	Category	Sample size	Mean Rank	H-Value	
Awareness					
1	Faculty	30	41.47	2.131 <sup>ns</sup>	
2	Post graduate students	30	50.97		
3	Undergraduate students	30	44.07	0.761 <sup>ns</sup>	
Attitude					
1	Faculty	30	45.40		
2	Post graduate students	30	48.50		

<b>3</b>	Undergraduate students	30	42.60
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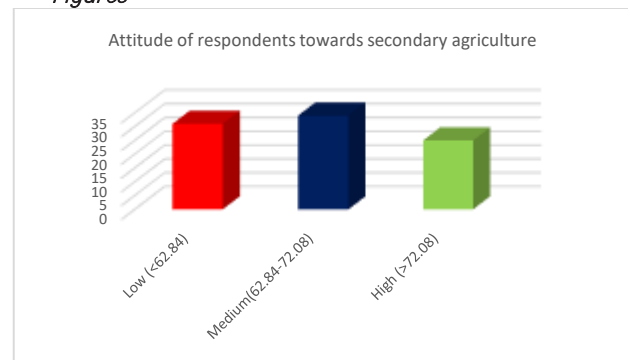
ns- non significant

**Table 7. Constraints In promoting Secondary Agriculture**

n = 90			
Sl. No	Statements	RII	Rank
	Inconsistent supply of raw materials	0.853	I
	<b>Lack of farmer's awareness regarding secondary agriculture</b>	0.820	II
	Absence of supply chain management	0.818	IV
	High investment cost	0.760	XI
	Lack of proper capacity building	0.769	VIII
	Lack of Government initiative	0.767	IX
	Marketing constraints	0.798	VII
	Linking primary agriculture to secondary agriculture is difficult task	0.767	IX
	Requires technical expertise	0.820	II
	Lack of financial support	0.800	VI
	Lack of nodal agency to monitor and coordinate the activities of secondary agriculture	0.802	V

\* RII- Relative Important Index

**Figures**



**Fig 1. Attitude of respondents towards secondary Agriculture**

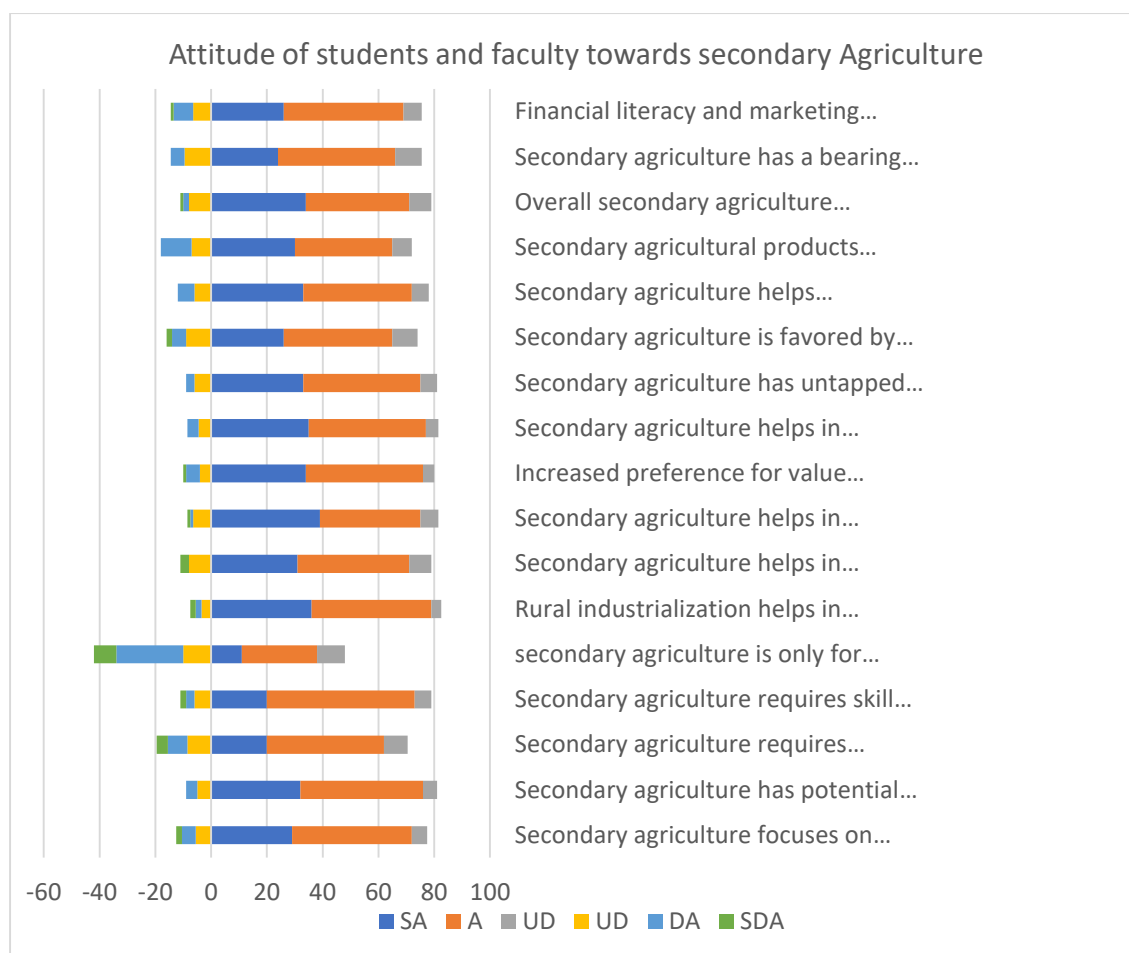


Fig 2.

Fig 2: Attitude of students and faculty towards secondary agriculture

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