

A STUDY ON AWARENESS OF BANANA EXPORTERS ON POLICIES AND MEASURES OF BANANA EXPORT

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Abstract

The export performance of banana exporters depends on the awareness of major policies and measures related to banana export. A census survey has been conducted in Tamil Nadu regarding the awareness of banana exporters on policies and measures relating to banana export using Factor Analysis. Among the nine variables of policies and measures, three factors which give a high level of export performance of exporters were Codex Standard, Global Gap, Sanitary and Phytosanitary Measures. In this study, Friedman Ranking Technique was used to identify the sources of information available for exporting banana. The major sources of information available for banana exporters to effectively carry out their banana export were internet, trade publications and the consultancies. Agricultural and Processed Food Products Export Development Authority (APEDA), should take immense steps to familiarise the banana exporters regarding the policies and measures relating to banana export to increase the export of banana from India.

Keywords: GATT, WTO, NHB, FAO, Factor Analysis, Friedman Ranking Technique.

1.Introduction.

The horticultural sector plays a dominant role in the development process of India. Within the agricultural sector, the fruits and vegetable segment has shown dynamism. Horticulture sector witnessed radical changes as a consequence of various reforms initiated by the Government of India. India is the second-largest producer of fruits in the world with a production of 92.9 million tonnes of fruits and 29.2 million tonnes of banana in 2016-17, which is around 31.4

percent of fruit production of India. (NHB Horticultural Statistics 2017). A large variety of fruits are grown in India, of which banana, citrus, guava, grape, pineapple, and apple are the major ones. Bananas are an important food security crop, cheap, readily available and rich in Vitamins A, C, B₆ and β -carotene. Due to urbanization in many developing countries, banana is an important and more important source of revenue for rural communities thus, banana plays an important role in poverty alleviation. Banana is a very sensitive commodity at the international level on the economic ground due to its volume of trade in the international trade.

2. Theoretical Background

2.1 Food and Safety Standards

The importance of food safety was emphasized due to the outbreak of BSE (Mad Cow Disease), foot and mouth diseases, environmental pollution and microbial contamination of fresh produce. Due to the worldwide safety concerns Article 20 of GATT (General Agreement on Trade and Tariffs) gave way to two WTO (World Trade Organisation) agreements namely Sanitary and Phytosanitary Measures Agreement (SPS Agreement) and “Technical Barriers to Trade Agreement (TBT Agreement)”.

In addition to these agreements, some private food standards were mostly set by different retailer associations, such as BRS Global Standard-Food (British Retail Consortium), International Food Standards (IFS) (German Retail Association and French Retailers), S&F Codes (Western Australian Department of Agriculture), Dutch HACCP Code (Dutch National Board of Experts), GlobalGap (Euro-Retail Produce Association) and Global Food Safety Initiative (GFSI) (Global Food Business Forum). These private standards are more stringent than international standards. Hence, the adoption of different food safety standards for different export destinations affects the potential of exporting firms from developing countries.

2.2 Sanitary and Phytosanitary Measures

Sanitary and Phytosanitary Measures Agreement set out the basic rules concerning food safety and animal and plant health standards. It allows countries to set their standards but also says that regulations must be based on science. Standards should be applied only to the extent necessary to protect human, animal or plant life or health. Further, these standards should not arbitrarily or unjustifiably discriminate between countries where identical

conditions prevail. Member countries are encouraged to use international standards, guidelines and recommendations where they exist. Members are also allowed to use higher standards if there is scientific justification and can also apply the “Precautionary Principle”, a kind of “Safety First” approach to deal with scientific uncertainty.

2.3 GLOBALGAP

GLOBALGAP, formerly known as EUREPGAP, is an internationally used management system for Good Agricultural Practices (GAP). The system was initiated by a group of European retailers in 1997, to provide more safe food products to European consumers. However, currently, the system has established itself as a key reference for GAP in the global market place covering more than 80 countries across the world. GLOBALGAP is a private sector body setting voluntary standards for the certification of agricultural products around the globe. It is a pre-farm gate standard, and the certificate covers the process of the certified product from farm inputs like feed or seedlings and all the farming activities until the product leaves the farm. It is a business to business label and is therefore not directly visible to consumers.

Good Agricultural Practices (GAP) are procedures that improve conventional methods of production, beginning with the choice of cultivation areas reaching until post-harvest procedures with emphasis on the health, well-being and safety of workers and consumers. Primary aims of GAP are: 1) healthy food production with minimum chemical use, 2) safe and safety foods towards zero microbial load and 3) preservation of the environment while exploiting the resources.

Some of the major risks minimizing measures covered under GAP are classified into 4 phases viz., pre-planning, production, harvest and post-harvest handling.

2.4 Codex Standard

The Codex Alimentarius, or the food code was established by the Food and Agricultural Organisation (FAO) of the United Nations and the World Health Organisation (WHO) to protect the health of consumers and ensure fair practices in food trade. The Codex Standards are a combination of grading for quality and inspection for wholesomeness, safety and freedom from economic fraud.

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In international trade disputes, Codex standards are guidelines which may be cited as reference texts at the World Trade Organization. A Government can adopt its own level of protection, by going beyond or stopping short of Codex. If a government chooses a higher level of protection, and in the event of a trade dispute, it may be required to justify the sanitary measure corresponding to its chosen level of protection on scientific, health or other legitimate grounds. In many countries, most food legislation is already consistent with Codex.

2.4.1 Codex Standard for Bananas

1. Bananas shall be obtained from varieties (cultivars) of *Musa*. Spp. Of the Musaceae family

2. Minimum Requirements

(i) Bananas shall be:

- (a) whole (taking finger as the reference),
- (b) firm,
- (c) sound,
- (d) clean, free of any visible foreign matter,
- (e) free of bruising,
- (f) free of pests affecting the general appearance of produce,
- (g) with the stalk intact, without bending, fungal damage or desiccation,
- (h) with pistils removed
- (i) free of malformation or abnormal curvature of the fingers,
- (j) free of damage caused by low temperature,
- (k) free of abnormal external moisture excluding condensation following removal from cold storage and bananas packed under modified atmosphere condition.
- (l) free of any foreign smell and/or taste

(ii) In addition, hands and cluster must include:

- a sufficient portion of the crown of normal colouring, sound and free of fungal contamination,
- a cleanly cut crown, not bevelled or torn, with no stalk fragments.

(iii) Bananas shall comply with the residue levels of heavy metals,

3.Review of Literature

Masayoshi Honma (1991) in his study on “Growth in Japan’s Horticultural trade with developing countries: An economic analysis of the market”, explored the possibilities and opportunities for expansion of horticultural exports from developing countries to a rapidly growing market of Japan. To reduce costs, developing countries should take advantage of abundant labour relative to capital and land because horticulture production is generally labour intensive. Improving public infrastructure is a key to developing countries to pursue this potential competitive advantage in horticulture and strengthen their competitiveness in the world market. The Phytosanitation regulation issues themselves have to be harmonized in international settings such as GATT negotiations. One way for developing countries to export more horticultural products is to satisfy conditions, so that bans on commodities can be lifted. Importing countries can assist by collaboration on research to develop better technologies for pest extermination and crop disinfection. Distribution costs for vegetables and fruits account for 50-70 per cent of retail prices in Japan, but it seems possible to reduce cost by integrating distribution. International transportation costs and margins are found to vary widely and in some trade flows, the international distribution costs account for 70 percent of the import price.

Chand(1997) in his Policy Paper on “Import Liberalization and Indian Agriculture - The Challenge and Strategy” reported that imports to India would not be attractive in the case of rice, tea, sunflower oil and cotton and the situation could turn favourable for imports of wheat and maize depending upon domestic and international supply positions. There was a strong possibility of a rise in imports of sugar and edible oils after removal of Quantitative Restrictions, which would exert downward pressure on the domestic prices of these commodities.

Suratha Nayak (2000) in his study on “Trade Liberalization and India’s Agricultural Export”, studied the export competitiveness and determinants of India’s agricultural exports during 1970-71 to 1996-97. The official exchange rate is concerned. It was found that India possessed both comparative and competitive advantage than in exporting non-traditional commodities. The commodities which possessed export competitiveness included fine cereals, coffee, oil cakes, fresh fruits, processed fruits and vegetables, spices, processed dairy

products and marine products. The commodities which did not possess comparative and competitive advantage included tea, sugar and edible oil.

4. Statement of the problem

The export performance of banana exporters depends on awareness of major policies and measures related to banana export such as awareness about codex standards and Exim policies, post-harvest storing and preserving facilities, knowledge about grading and export packing measures to minimize wastage, necessary mechanical handling for export standards, Government support and awareness measures, linkage between producers and exporters. The Government of India has taken lot of steps to make aware of major policies and measures related to banana export.

Being the largest producer of banana, especially Tamil Nadu, the study area, being one of the highest producing state in India, but India being the minimum exporter of banana. Hence, this study.

5. Objectives of the study

- a. To assess the awareness of banana exporters on policies and measures of banana export.
- b. To ascertain the usage of sources of information of banana export by banana exporters.

6. Data and Methodology

To achieve the objectives of the study, both primary and secondary data were used. A field survey technique was employed to collect the primary data from all the banana exporters of Tamil Nadu, through a well-structured questionnaire. The secondary data were collected from the records of General Agreement on Tariffs and Trade (GATT), World Trade Organization (WTO), National Horticultural Board of India (NHB), Agricultural and Processed Food Export Development Authority (APEDA), and Food and Agricultural Organisation of the United Nations (FAO), as well as from Internet web sources.

a. Factor Analysis

Factor analysis is a method used to transform a set of variables into a small number of linear composites which have maximum correlation with original variables. Factor analysis used to study a complex product (service), in order to identify the major characteristics (or factors), are considered important by the respondents. Factor analysis applies an advanced correlation analysis to the responses given by the respondents. The purpose of factor analysis is to determine if the responses to the several statements are correlated. If the responses to the

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several statements are significantly correlated, it is believed that the statements measure some factors are common to all of them.

Factor analysis can only be applied to continuous variables or interval scaled variables. A factor analysis is like a regression analysis as it tries to “best fit” factors to a scatter diagram of data in such a way that factors explain the variants associated with response to each statement.

Awareness about the nine policies and measure statements (Factors) related to banana export, Viz., Exim Policy, Government norms for banana, Global Gap, Codex Standard, Sanitary and Phytosanitary measures, Transport assistance, Packing assistance, Export finance for banana export and Shelf life of banana were considered.

b. Friedman Ranking Technique

This technique was used to ascertain the important source of information available to banana exporters for banana export. In this method, the respondents were asked to rank the sources of information available for exporting banana. The order of merit given by the respondents was converted into mean rank scores. These mean rank scores for all the factors were arranged in the order of their ranks and the inferences were drawn.

7.Results and Discussion

Mean, Standard Deviation and Coefficient of Variation of State-wise Production of Banana in India, Country-wise Export of Banana from India, Awareness about Policies and Measures using Factor Analysis and Friedman Ranking Technique to rank the sources of information available for banana export.

7.1 State wise Production of Banana in India from 2011-12 to 2016-17

Table.1 State wise Production of Banana in India from 2011-12 to 2016-17

STATE WISE PRODUCTION OF BANANA PRODUCTION IN INDIA									
STATE	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	Mean	S.D	C.V
Tamil Nadu	6736.4	5136.2	5650	4147.18	4331.65	3640.73	4940.36	1136.35	23.00

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Maharashtra	4315	3600	4830.6	4030.58	3025.15	3072.49	3812.30	714.04	18.73
Gujarat	4047.8	4523.49	4225.49	4324.36	4185.52	4185.52	4248.70	161.32	3.80
Andhra Pradesh	2899.6	3242.8	3166.9	3487.31	3570.62	4143.55	3418.46	428.25	12.53
Karnataka	2351.5	2529.6	2675.63	2593.33	2370.95	2489.5	2501.75	125.88	5.03
Madhya Pradesh	1379.2	1701	1735	1836	1785.05	1646.89	1680.52	161.50	9.61
Bihar	1580.5	1702.41	1435.78	1535	1535.3	1550.65	1556.61	86.47	5.56
Kerala	419.5	515.61	528.21	1270.57	1292.41	1224.13	875.07	426.50	48.74
West Bengal	1054	1077.8	1097.5	1124	1172.34	1195.6	1120.21	54.98	4.91
Assam	745.3	837.02	857.72	865.67	882.71	979.34	861.29	75.46	8.76
Chhattisgarh	381.7	413.4	498.81	564.43	587.42	618.92	510.78	96.68	18.93
Odisha	506.2	521.31	476.6	469.25	462.71	466.62	483.78	24.13	4.99
Tripura	125	133.7	134.25	141.31	153.62	152.08	139.99	11.23	8.02
Others	1913.4	574.76	2412.06	2832.48	3806.47	3796.53	2555.95	1227.84	48.04
Total	28455.1	26509.1	29724.55	29221.47	29134.82	29162.55	28701.27	1147.58	4.00

Source: NHB Statistics.

Table.1 reveals that the production of banana in Tamil Nadu between 2011-12 and 2016-17 showed a decreasing trend. The trend of Andhra Pradesh, Kerala and Chhattisgarh was an increasing one. Due to more than two-fold increase in production of Kerala during the period of study its coefficient of variation of was high with 48.74 percent. Whereas, the coefficient of variation for Tamil Nadu, Maharashtra and Chhattisgarh was also high due to high volatility in production.

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7.2 Country wise Export of Banana by India from 2009 to 2017

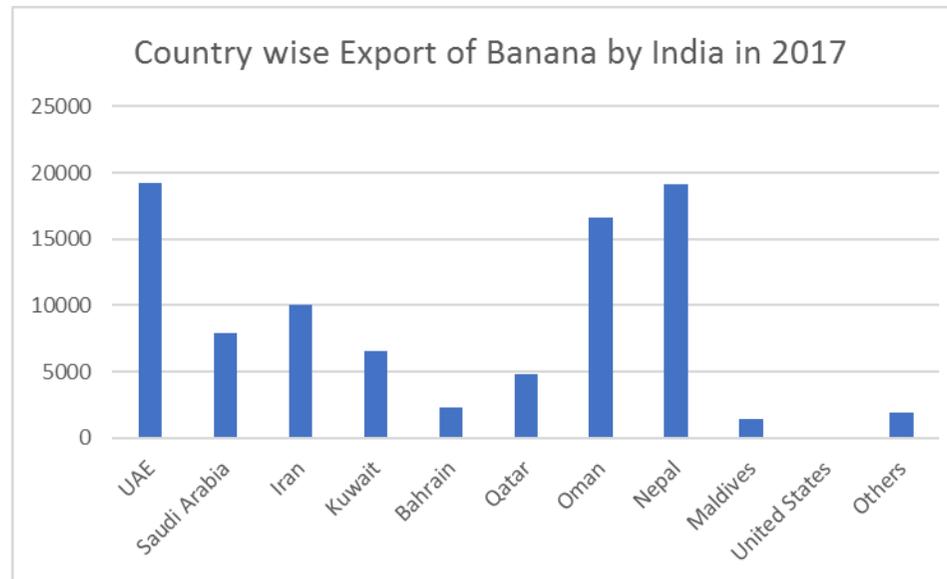
Table.2 Country wise Export of Banana by India from 2009 to 2017

Country	2009	2010	2011	2012	2013	2014	2015	2016	2017	Mean	Std.Dev	C.V
UAE	18644 (34.35)	14099 (23.18)	11925 (29.14)	16625 (30.91)	14712 (39.6)	16655 (30.56)	27685 (34.52)	26339 (23.56)	19182 (21.35)	18429.56	5363.34	29.10
Saudi Arabia	9396 (17.31)	10556 (17.36)	4708 (11.51)	4791 (8.91)	4650 (12.52)	7993 (14.67)	12914 (16.1)	11328 (10.13)	7907 (8.8)	8249.22	3072.30	37.24
Iran	5238 (9.65)	9890 (16.26)	3673 (8.98)	2332 (4.34)	1048 (2.82)	1295 (2.38)	15243 (19.01)	19990 (17.88)	9989 (11.12)	7633.11	6654.91	87.19
Kuwait	5552 (10.23)	4221 (6.94)	4425 (10.81)	2673 (4.97)	2124 (5.72)	3722 (6.83)	4001 (4.99)	11464 (10.25)	6521 (7.26)	4967.00	2775.94	55.89
Bahrain	2890 (5.32)	11519 (18.94)	1771 (4.33)	3121 (5.8)	2146 (5.78)	1838 (3.37)	1873 (2.34)	2456 (2.2)	2290 (2.55)	3322.67	3108.92	93.57
Qatar	2684 (4.95)	2228 (3.66)	1548 (3.78)	3054 (5.68)	2090 (5.63)	2944 (5.4)	3042 (3.79)	3398 (3.04)	4793 (5.34)	2864.56	925.22	32.30
Oman	1977 (3.64)	1645 (2.7)	1779 (4.35)	2704 (5.03)	4345 (11.7)	4352 (7.99)	6732 (8.4)	12686 (11.35)	16647 (18.53)	5874.11	5335.50	90.83
Nepal	6498 (11.97)	4790 (7.88)	9600 (23.46)	10991 (20.43)	5332 (14.35)	7357 (13.5)	7498 (9.35)	21017 (18.8)	19134 (21.3)	10246.33	5914.43	57.72
Maldives	648 (1.19)	953 (1.57)	946 (2.31)	684 (1.27)	310 (0.83)	553 (1.01)	818 (1.02)	1278 (1.14)	1462 (1.63)	850.22	358.25	42.14
United States of America	105 (0.19)	125 (0.21)	24 (0.06)	20 (0.04)	1 (0.00)	26 (0.05)	3 (0.00)	28 (0.03)	40 (0.04)	41.33	43.76	105.87
Others	641 (1.18)	787 (1.29)	522 (1.28)	6798 (12.64)	392 (1.06)	7761 (14.24)	380 (0.47)	1819 (1.63)	1872 (2.08)	2330.22	2872.07	123.25
Total	54273	60813	40921	53793	37150	54496	80189	111803	89837	64808.33	24397.04	37.65

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Table.2 reveals that U.A.E., Nepal, Oman, Iran, Saudi Arabia, and Kuwait have imported 21.35 percent, 21.3percent, 18.53 percent, 11.12 percent, 8.8 percent, and 7.26 percent respectively during 2017 and total import of banana by these countries from India were 88.36 percent in 2017. The export of banana to Bahrain, Oman and Iran were highly volatile with coefficient of variation of 93.57 percent, 90.83 percent and 87.19 percent. The export to Qatar was steadily increased without much fluctuation, with a coefficient of variation of 32.3 percent. The export to United States of America was more or less negligible. It is clear from the above table that the main export destinations of Indian Banana were Middle East, mostly to cater the needs of emigrated population of Indians in those countries. The main importers of banana in the world are the developed countries, but India’s share of export to the developed countries is negligible.

Chart. 1 Country wise Export of Banana by India in 2017



7.3 Awareness of Policies and Measures by banana exporters

The export performance of the respondents was studied by awareness on policies and measures. There are nine policies and measures were considered for this study.

Table. 3 Kaiser-Mayer-Olkin-Measure and Bartlett's Test

Kaiser-Mayer-Olkin-Measure of Sampling Adequacy		0.667
Bartlett's test of sphericity	Approx. Chi-Square	161.5
	Degrees of freedom	36
	Significance	0.000

The above table of Bartlett's test of sphericity and Kaiser-Mayer-Olkin - measure of sampling adequacy was used to test the appropriateness of the factor model. In this study, the KMO measure of sampling adequacy was 0.667, which is higher than the standard 0.5. Bartlett's test is used to find out the variables are not correlated. Since the appropriate chi-square value on awareness of policies and measures is 161.5 which is significant at 1% level.

The value of KMO statistics is also high; thus, the factor analysis is considering an appropriate technique for analysing the correlation matrix.

Determination of Factors Eigen's Value

The factors with Eigen values greater than 1.0 are maintained, the other factors are not included. Since there are three factors possessing Eigen value which are greater than 1.0 i.e., out of 9 factors loaded in the factor analysis, only 3 factors said to be extracted from the total of 9 factors.

Table. 4 Total Variance Explained

Component	Initial Eigen values			Extraction sum of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.025	33.610	33.610	3.025	33.610	33.610	2.615	29.060	29.060
2	1.349	14.986	48.596	1.349	14.986	48.596	1.566	17.400	46.460
3	1.267	14.081	62.677	1.267	14.081	62.677	1.460	16.217	62.677
4	0.980	10.893	73.570						
5	0.775	8.608	82.178						
6	0.569	6.318	88.497						
7	0.469	5.213	93.710						
8	0.290	3.218	96.928						
9	0.277	3.072	100.000						

Extraction Method: Principal Component Analysis

It is observed from Table No.4. that the Initial Eigen values used to highlights that the Eigen value for a factor indicates total variances attributed to the factor. Factor 1, accounts for variance 3.025 with 33.610 %, likewise the second factor accounts for variance 1.349 with 14.986%. The third factor showed the variance 1.267 with 14.081 % and the first 3 factors combined together accounts for 65.514 %.

Table.5 Component Matrix

Policies and Measures	Component		
	1	2	3
Sanitary and Phytosanitary Measures	0.802	-0.202	-0.127
Codex Standard	0.778	-0.370	0.067
Global Gap	0.772	-0.371	0.136
Packing Assistance	0.685	0.112	0.228
Exim Policy	0.491	0.010	-0.462
Export Finance	0.317	0.638	-0.269
Transport Assistance	0.346	0.622	0.425
Shelf Life	0.276	0.242	0.648
Government Norms	0.415	0.410	-0.538

Extraction Method: Principal Component Analysis.

a. 3 Components extracted

It is learned from the above table that the component matrix indicates the relationship between the factors and individual variables. It seen that several factors have a high correlation with the same component. For better interpretability, interpretation is formulated by identifying the variables that have large loadings on the same factor. That factor can then be interpreted in terms of variables that had high on it.

Table. 6 Component Transformation Matrix

Component	1	2	3
1	0.869	0.389	0.305
2	-0.493	0.640	0.590
3	0.034	-0.663	0.748

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization

Table No.7 Rotated Component Matrix

Policies and Measures	Component		
	1	2	3
Codex Standard	0.861	0.021	0.069
Global Gap	0.859	-0.027	0.119
Sanitary and Phytosanitary Measures	0.729	0.268	0.030
Packing Assistance	0.548	0.187	0.446

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Government Norms	0.140	0.781	-0.034
Export Finance	-0.049	0.710	0.272
Exim Policy	0.407	0.504	-0.189
Transport Assistance	0.009	0.250	0.790
Shelf Life	0.142	-0.168	0.711

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization

a. Rotation converged in 5 iterations.

The above table rotated component matrix shows the clear separation. The rotated factor F1, Codex Standard with high co-efficient, explaining that it has a strong influence as facilitating factor of awareness on export performance. Similarly, the factor 2, Global Gap and factor 3 Sanitary and Phytosanitary measures have high co-efficient values, it indicates that these three factors have strong influence as facilitating factor of awareness on export performance.

From the analysis, it is learned that out of 9 variables loaded in the factor analysis, only 3 factors are extracted, which shows that the data reduction has been condensed to 3 factors which gives high level of export performance of the exporters. These three variables are called highly influencing policies and measures for the respondents exporting banana.

7.4 Sources of Information Available for Exporting Banana

The various sources of information available to the banana exporters are trade publications and directories, Governmental publications, trade associations, internet and consultants. To ascertain the important source of information available to banana export among these categories, Friedman Ranking Technique was applied.

Table. 8 Sources of Information Available for Exporting Banana

S.No	Sources of information	Mean Rank score	Rank
1	Internet	4.93	I
2	Trade publications and	2.91	II
3	Consultancy	2.54	III
4	Trade associations	2.33	IV
5	Government Publications	2.29	V

Table.8 highlights that the banana exporters utilize the internet as a major source of information which occupies the first rank with the Friedman mean score of 4.93. It is

followed by trade publications with a mean score of 2.91. Consultants are placed in the third position with a Friedman rank score of 2.54. Trade associations was ranked in the fourth place with a mean score of 2.33. Lastly, Government publications placed in the fifth position with a mean score of 2.29. From the analysis, it is concluded that the major sources of information available for banana exporters to export banana are internet, trade publications and consultants.

8. Conclusions

In India, within the agricultural sector, horticulture plays a dominant role. To maintain the quality and food safety, various food safety standards were established by institutions such as WTO, and different retailer associations. To solve the dispute in quality in the international trade, Codex Standard was established by the Food and Agricultural Organisation of the United Nations (FAO) and the World Health Organisation (WHO) as a reference. The main export destinations of Indian banana were Middle East Countries and India's share to the developed nations were negligible. The Factor Analysis showed that Codex Standard, Global GAP and Sanitary and Phytosanitary measures were the highly influencing policies and measures of the banana exporters. Friedman Ranking technique showed that the major sources of information available for banana exporters to carry out their banana export effectively were internet, trade publications and consultants. The Government of India has to take necessary steps through APEDA to familiarise the policies and measures related to banana export among the banana exports, provide all necessary information related to banana export to the exporters and to meet the stringent import standards of developed countries, investment support to be provided to the banana exporters to increase the export of banana from India.

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