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# AMBER

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# *Editorial*

Dear Readers,

At the outset, warm greetings from Acharya Bangalore B School, Bengaluru. I am happy to present the Volume 7, Issue 2 of AMBER, with the theme 'Retailing'.

Retailing is an integral part of the modern society. It shapes the way of life. In recent times, buying and selling of goods have become a technology enabled and brand dominated activity. The importance of retail sector is reflected in its contribution to the growth of an economy. It contributes close to 10% of the national GDP. Retailing is the driving force of the economy. It aims at promoting its sustained growth. Due to its dominant position in the supply chain, the retail structure has steadily developed over the years. The pace of growth within retailing is accelerating. Retailing has emerged from a number of interrelated disciplines such as technology, psychology, logistics, HRM, financial management, geography, economics, management and marketing.

Potter has described the academic study of retailing as the "Cinderella of the social sciences". Academic journals focusing on retailing are being published worldwide. In today's society, retailers are the major employers. It is estimated in developed countries that retail industry employs one in nine of the workforce. Retailers employ a significant proportion of the overall workforce. In India there are more than 4 crore people employed in around 12 million retail units. Retailers are becoming increasingly important in their role as gatekeepers within the channel of distribution. In the past, suppliers were dominant. Retailers supplied the merchandise that was on offer and consumers selected from them.

As retailers have become significantly powerful, they are able to influence suppliers and stock only the brands they wish to sell. So, consumers are able to buy only what is stocked and offered to them by the retailers. Retailers are thus considered as shaping consumer demand. Retailing offers scope for shifting retail operations outside the home market. Retailers who focus on luxury goods markets are expanding their business internationally. Retailers are moving into more geographically and culturally distant markets. Technology and supply chain enabled e-retailing are bringing in paradigm shift in the retail tapestry. This issue highlights few of the changes which is sweeping the retail sector.

This issue consists of six research papers, a case study, a book review and a research paper from the student. Wide range of topics such as, Usage of Smart Phone for E-Commerce, Consumers' Retail Format Choice, Influence of Weather Variables on Productivity of Food-Grain Crops, Use of ICT among women farmers, Linkage between Demographic Factors and Employee Job Satisfaction, etc. These contributions are thought provoking, and will add to the existing body of knowledge in the respective domain.

I profusely thank the contributors of this volume and the management of Acharya Bangalore B School, for helping us to come up with another great issue of AMBER. I would fail in my duty if I do not thank the Executive Editor, Prof. Syed Kazim for his relentless effort in making this issue see the light of the day, in time. Thanks Mr. Kazim.

Dr. H.R. Venkatesha  
Chief Editor

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# 1

## A Study on the Usage of Smart Phone for E-Commerce in Bengaluru

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### Abstract

There are many people online on smart phones who are at any time potential consumers in the online market. Since there are enough providers, the most important thing for organisations is to learn the consumer's immediate requirements in this competitive business environment. Customer behaviours are influenced by diverse factors such as culture, social class, references group relation, family, income level, independency, age, gender etc., and so they do show different customer behaviours.

Smart phones help purchase and local search provides consumers anytime, their feasibility to information is via internet. Awareness of purchase and local search is on the rise with consumers, opening new opportunities for brands and vendors to exploit the power of the mobile channel. Before the advent of internet- on- smart phones, net search used to be a purely desktop affair, but it is not so now.

The objective of the study is to know about the usage of Smart Phone for E-Commerce activities, to analyse the impact on purchasing products through Smart Phone and to understand the future prospects of online sales through Smart Phone. The result of this study would contribute marketers who intend to penetrate the market probably in the urban India and would help maintain loyalty of their customers.

**Key Words:** Smart Phone, E-Commerce, Retailing, Local Search, Purchase

### Introduction

The phenomenal growth of internet use on smartphone is far surpassing than that of the fixed-internet users. E-Marketer estimates that in 2008 there were more than twice as many mobile internet users (106 million) as fixed-internet users (40.7 million). By 2018, mobile users (298 million) are expected to triple fixed users (85.8 million).

Recently mobile loyalty company SessionM randomly surveyed 12,000 selected US smartphone users on their mobile shopping behaviours. The company found 85% of respondents averred their m-commerce buying was steady or had increased compared with the previous year. While roughly 15% opined mobile buying had increased "significantly," personal data security and/or poor user experiences (e.g., product images too small) were reported barriers to further growth of mobile e-commerce.

Another top in-store smartphone behaviour, not on this list, is seeking coupons or deals. Though, not in top three above, in-store deal-seeking is consistently found to be one of the top smartphone uses (No clarity in idea). Two important marketing opportunities for retailers were identified (or reinforced) in the data, opportunity surrounding in-store push notifications about deals/offers (57% were more likely to shop at a store if available) and loyalty programs (76% would be more likely to shop at a store if available).

As indicated, the SessionM data confirm a well-established, growing body of consumer survey and behavioural data around in-store smartphone

usage. Yet most retailers have been painfully slow to take advantage of it (rather, they cry "showrooming"). Deals and loyalty programs are two reasons for shoppers to download a retailer app, which can then get them to opt-in to notifications. Mobile payments are another reason, but in most cases, that option isn't ready. Retailers must see in-store smartphone usage as an extension of the traditional retail experience and adapt their apps, mobile sites and in-store signage (and other marketing) to take account of and leverage smartphone shopper behaviour. Believe it or not, eight years in, there's still an opportunity to be a mobile "early adopter" in retail.

#### Review Literature

20th century has been an era that, social, economic and political changes have occurred at unprecedented speed. Along with the globalisation, disappearance of the borders, technologic developments and unavoidable passing to the information the society as a whole, has undergone a sea change. Especially, in the later part of the 20th century with rapid changes in the information technology, computers have become an integral part of life. In the information era, the Internet has become more and more necessary. With the advancement in the information and communication technologies over the years, computers' capacities have grown rapidly and local networks have become a network that connects all the computers in the world, the Internet.

Electronic commerce, also referred as e-commerce is defined by Oxford Dictionary as 'commercial transactions conducted electronically on the Internet'. Another definition made by Financial Times as a buying and selling activity over the Internet. To sum up e-commerce can be defined as the buying, selling and exchanging of goods and services through an electronic medium (the Internet) by businesses, consumers and other parties without any physical contact and exchange.

'The rise of these new information and communication technologies and of Internet users, introduced a new marketing reality' (Xavier

and Pereira, 2006). This new presence changes the relations between the players. Furthermore, businesses have realised the relevance of the Internet and it has become that e-commerce in the business context, for most companies, can be seen as a complement (Shaw, 2006). The importance of the competitive power and superiority has come to foreground and organisations' understanding of competition has changed dramatically. In today's world, businesses use electronic commerce channels to communicate with customers and to increase competitive advantage (Lee and Lin, 2005).

So many companies now operate on the Internet. Some of companies only have a web presence, called as click-only dot-coms, such as Amazon.com and Expedia.com. These companies sell products and services directly to consumers via the Internet. On the other hand traditional companies also enhance their marketing strategies to adopt today's requirements and create their own online sales channels and become click-and-mortar companies. Nowadays it is hard to find an organisation that doesn't have a web presence (Kotler and Armstrong, 2012).

Considering the characteristics of the buying and selling parties E-commerce has been divided into four categories. These categories are: business to business (B2B), business to consumer (B2C) consumer to consumer (C2C) and consumer to business (C2B) (Korper and Ellis, 2001).

The emergence of e-commerce began with two organisations. Amazon.com, Inc and eBay Inc. have been the early leaders of the e-commerce industry (Slideshare, 2011). Both are now offering different types of products to different parts of the world. Since then, Amazon and Ebay have become the icons of the new economy. Visiting their Web sites has somehow become part of our routine (Shaw, 2006).

Amazon is founded by Jeff Bazos in 1994 in Washington and the website has launched in 1995. They started with an online book store. Amazon also provided to consumers to order hard-to-find books as easily as best sellers (Postrel, 1996). Amazon also developed systems; such as 'Search Inside the Book' and '1-click®

'Shopping' (Amazon, 2012) which make them pioneers of innovations. Being first in the market provided to Amazon.com a trusted brand name (Economist, 2000).

Advance in wireless technology has increased the number mobile device users. Nowadays, they have become a part of our lives. This trend has provided with an opportunity to shop online via mobile devices, such as smart phones, e-readers, tablets, etc. (Hillman et. al, 2012). Moreover, it's no secret anymore that with the developments of mobile devices, smartphones or tablets, online shopping have become more convenient (Judith, 2012). Mobile devices 'also contributed to the increase in sales' (Ninjas, 2012). These innovations of the technology more likely encourages consumers buy online.

Recently, with the development of the Internet, many entrepreneurs have tried to create and provide new online businesses to benefit the advantages of the Internet. Furthermore, the internet environments affected the businesses and have forced them to include themselves in this environment. With the emergence of group buying system both businesses and consumers were benefitted. Group buying web sites first appeared in 1998 (Hackl, 2004) and developed rapidly. The main idea is that, consumers can use their bargaining power to decrease the prices and on the other hand suppliers can 'diminish their cost of recruiting customers' (Kauffman, et al., 2010). With online group buying system individuals enable to purchase products or services with a daily deal and for many different types (Erdogmus and Cicek, 2011). Here, price is the mainly element that affects and maybe changes a consumers' decision.

The traditional way of shopping has become insufficient for individuals thanks to technological innovations. Individuals now prefer easy ways to reach brands and stores and it can be said that 'The Internet has fundamentally changed customer's notions of convenience, speed, price, product information and service. As a result, it has given marketers a whole new way to create value for customers and build relationships with them' (Kotler and Armstrong, 2012).

It is not a secret that the primary goal of business is to sell. For commercial activities, analysing consumers' behaviours is crucial (Deaton and Muellbauer, 1980, Solomon, 2006, Wright and et al., 2008) and since there is no face-to-face interaction in online businesses, it becomes more important to understand key features of consumer behaviours. Rogan (Nazir, et al., 2012) indicates the importance of the relationship between the marketing strategy and the behaviour of consumer. He illustrates that 'the strategy is about increasing the probability and frequency of buyer behaviour and requirements and to succeed in doing this is to know the customer and understand the consumer's requirements.'

The study by SessionM states that, 90 percentage of respondents said they had made a retail purchase in the past 90 days. The great majority (73 percentage) made so in a traditional, physical store. Roughly 53 percentage agreed that the in-store experience was still superior to online/mobile shopping. However, confirming the findings of many earlier surveys, the overwhelming majority (90 percentage) said they use their smartphones in stores while shopping. The top activities on smartphones while in-stores are, Price comparisons - 54 percentage, looking up product information - 48 percentage and checking reviews online - 42 percentage.

#### Objectives

- To study on the usage of Smart Phone for E-Commerce activities.
- To analyse the impact on purchasing products through Smart Phone.
- To understand the future prospects of online sales through Smart Phone.

#### Research Methodology

- Study Area: The study area for the research was held in Bengaluru.
- Sample Size: The sample size for the study was 100 respondents.
- Sampling Technique: The sample techniques selected through the structured questionnaire was random sampling.

- Source and Type of Data: Primary and Secondary data are the sources of data were collected from the respondents through interview, meeting, observation, earlier published journals, research papers and online articles.
- Research Instrument: Questionnaire was the main instrument used in data collection.
- Data Collating/Processing: The data collection was then collated and analyzed using SPSS package.

#### Analysis and Interpretation

Table No. 1: Demographic Characteristics

Gender		
Options	Frequency	Percentage
Male	63	63.0
Female	37	37.0
Total	100	100.0

#### Occupation

Options	Frequency	Percentage
Doctors	25	25.0
Engineers	25	25.0
Self Employed	25	25.0
Freelancers	25	25.0
Total	100	100.0

#### Annual Income

Options	Frequency	Percentage
Below 5 Lakhs	60	60.0
5 to 10 Lakhs	35	35.0
More than 10 lakhs	5	5.0
Total	100	100.0

Source: Primary Data

From the above tables we can learn that 63% of the respondents were male and 37% of the respondents were female. From occupation we can learn that 25% were doctors, 25% engineers, 25% self-employed and the remaining 25% freelancers. According to the annual income 60% of the respondents earned below Rs. 5 lakhs per year, 35% of the respondents earned Rs. 5 to 10 lakhs per year and only 5% of the respondents earned more than Rs. 10 lakhs per year.

#### Descriptive Analysis

Table No. 2: Use of Internet on Smart Phone

Options	Frequency	Percentage
No internet on phone	4	4.0
Have internet but not using	8	8.0
Have internet but use it rarely	20	20.0
Have internet and use it often	68	68.0
Total	100	100.0

Source: Primary Data

From the table it can be learnt that majority of the people who have a smart phone use internet. The table shows that 68% of the respondents use internet in smart phone, 20% use it rarely, 8% have internet but they do not use it and 4% of the respondents do not have internet in their smart phone.

Table No. 3: Reason for using Smart Phone for Purchase

Options	Frequency	Percentage
Low Price	11	11.0
High Convenience	47	47.0
Quick Delivery	16	16.0
Serviceability	7	7.0
Other Specific Reasons	19	19.0
Total	100	100.0

Source: Primary Data

From the table we can learn that the respondents use smart phone to purchase products because it is convenient to them, then because of its quick delivery and the price being competitive.

Table No. 4: Information for Retail Products

Options	Frequency	Percentage
Opinion of friends and relatives	53	53.0
Online reviews	34	34.0
Google	7	7.0
Social networking sites	3	3.0
Others	3	3.0
Total	100	100.0

Source: Primary Data

From the table we learn that majority of the respondents before purchasing the product get information from their relatives, based on online reviews, through Google search and also through social networking sites.

Table No. 5: Using Smart Phone to give Reviews

Options	Frequency	Percentage
Never post a review	24	24.0
Occasionally	51	51.0
Multiple times a week	25	25.0
Total	100	100.0

Source: Primary Data

From the table we learn that majority of the respondents post reviews occasionally, 25% of the respondents are active and they post multiple times a week and 24% of the respondents never post any.

Table No. 6: Searching for Local Information

Options	Frequency	Percentage
Ask friends or relatives	72	72.0
Ask neighbours	4	4.0
Ask any one on the street	7	7.0
On Smart Phone	17	17.0
Total	100	100.0

Source: Primary Data

From the table we learn that 72% of the respondents ask their friends and relatives for any information, 17% do use smart phone, 7% ask people on the road and just 4% ask their neighbours.

#### Factor Analysis

Use of Smart Phone for various purposes

Table No. 7: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.680
Bartlett's Test of Sphericity	Approx. Chi-Square	292.228
	df	28
	Sig.	.000

Source: Primary Data

Based on the above output, the KMO = 0.680. This shows that the degree of common variance is quite high; therefore factor analysis can be conducted. The Chi-square value of Bartlett's Test of Sphericity is 292.228 and the significant value is 0.000, indicating that the data is suitable for factor analysis.

Table No. 8: Rotated Component Matrix

Statements	1	2
Reading Newspapers and Magazines	.801	
Playing Games		.852
Chatting		.651
Research/Education Purposes	.539	
Finding Information about Products	.596	
Shopping	.684	
Communication (E-mail)	.829	
Work/Business Related	.727	

Source: Primary Data

The Rotated Component Matrix indicates, based on factor loadings that these 8 components were reduced to 2 factors. Details of the factors are given in below table.

Table No. 9: List of Factors

Sl. No	Compo nent	TVE	Variable	RCMV
1	Serious	43.514	Reading Newspapers and Magazines	.801
			Research/Education Purposes	.539
			Finding Information about Products	.596
			Shopping	.684
			Communication (E-mail)	.829
			Work/Business Related	.727
2	Non-Serious	15.786	Playing Games	.852
			Chatting	.651

Source: Primary Data

### Preference to Purchase through Smart Phone

Table No. 10: KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.562
Bartlett's Test of Sphericity	Approx. Chi-Square	409.031
	df	91
	Sig.	.000

Source: Primary Data

Based on the above output, the KMO = 0.562. This shows the degree of common variance quite high; therefore factor analysis can be conducted. The Chi-square value of Bartlett's Test of Sphericity is 409.031 and the significant value is 0.000, thus indicating data suitable for factor analysis.

Table No. 11: Rotated Component Matrix

Statements	1	2	3	4
Grocery Items				.749
Books				.396
Cosmetics				.447
Education Related Products				.684
Baby Products				.376
Clothes				.017
Computer Products	.127			
Footwear	.812			
Gifts	.687			
Laptops and Computers		.739		
Lifestyle Products			.826	
Music Players			.747	
Storage Devices		.688		

Source: Primary Data

The Rotated Component Matrix indicates, based on factor loadings that these 14 components were reduced to 4 factors. Details of the factors are given below.

Table No. 12: List of Factors

Sl. No	Component	TVE	Variable	RCMV
1	Basic Needs	25.741	Grocery Items Books Cosmetics Education Related Products Baby Products Clothes	.749 .396 .447 .684 .376 .017
2	Self and Social Needs	11.861	Computer Products Footwear Gifts	.127 .812 .687
3	Electronical Gadgets	10.544	Laptops and Computers Storage Devices	.739 .688
4	Luxury Products	9.235	Lifestyle Products Music Players	.826 .747

Source: Primary Data

Reason for using Smart Phone for Purchasing Products

Table No. 13: KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.671
Bartlett's Test of Sphericity	Approx. Chi-Square	172.530
	df	15
	Sig.	.000

Source: Primary Data

Based on the above output, the KMO = 0.671. This shows that the degree of common variance is quite high; therefore factor analysis can be conducted. The Chi-square value of Bartlett's Test of Sphericity is 172.530 and the significant value is 0.000, thus indicating data suitable for factor analysis.

Table No. 14: Rotated Component Matrix

Statements	1	2
Delivery Time - Speed	.904	
Relevance of Result		.770
User Experience	.618	
Pricing	.825	
Goods Description		.807
Economy Price	.774	

Source: Primary Data

The Rotated Component Matrix indicates, based on factor loadings that these 6 components were reduced to 2 factors. Details of the factors are given in below table.

Table No. 15: List of Factors

Sl. No.	Compo nent	TVE	Variable	RCMV
1	Primary Reason	41.867	Delivery Time - Speed User Experience Pricing Economy Price	.904 .618 .825 .774
2	Second ary Reason	22.961	Relevance of Result Goods Description	.770 .807

Source: Primary Data

### Conclusion

Today, Smart Phones have become an integral part of majority of the people who live in urban limit. Most of the respondents with a Smart Phone do use internet to purchase products and to get more details about the product. People don't purchase products through Smart Phone because of its low price but because of its convenience. The first source of information is friends/ relatives followed by Smart Phone; this makes Smart Phone the second choice. Companies should also be careful with the reviews as the study shows that 51% of the respondents review occasionally. Various factors were identified in the study. With respect to use of smart phone, people use it for two purposes, serious and non-serious activities. The serious activities comprise of reading newspapers and magazines, research and

educational purpose, finding information about products, shopping, e-mail, and for business related activities. Non-serious activities include playing games and chatting.

With reference to using Smart Phone to purchase products, four factors were identified. The first factor refers to the basic needs which comprise of groceries, books, cosmetics, educational products, baby products and clothes. The second factor refers to self and social needs such as computer related products, footwear and gifts. The third factor refers to electronic gadgets like laptops, computers and storage devices. The fourth and final product refers to luxury products such as lifestyle products and music players.

With reference to the reason behind using Smart Phone to purchase products, two factors were identified. The first factor refers to primary reasons, it basically refers to delivery time, user experience, pricing, and economic price. The second factor refers to secondary reasons, such as, getting relevant results of the product search and viewing good description about the same. Thus, the result derived from descriptive analysis and the various factors identified, would help Smart Phone manufacturing companies and e-commerce companies to project their products at a better way by understanding the customer's needs and preferences.

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## 2

# A Study of Consumers' Retail Format Choice & Patronage Behaviour in Food & Grocery Retailing at Bengaluru

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### Abstract

Retailing in India is an uncharted territory. Retailing in India is gaining attention like never before. Organized retailing is creating euphoria amongst Indian consumers drawing them into malls and trade areas in huge numbers. Retailers are offering newer service dimensions to create unique shopping experience for customers. Shopping for food and grocery products has witnessed a revolution in Indian retail market with the conspicuous changes in the consumer buying behaviour driven by strong income growth, changing life styles and favorable demographic patterns. Most of the food and grocery products reach the consumers through Neighborhood kirana stores which are unorganized. But the very fast changing trends in consumption patterns, food and eating habits of consumers have contributed immensely to the growth and development of 'Western' format typologies such as super markets, convenience stores, discount stores and hyper markets. This dissertation aimed to explore and examine the predictability of major constructs (i.e., shopper attributes, store attributes, information sources and situational factors) on retail format choice behaviour in food and grocery retailing from the proposed model based on the identification of research gaps. This research paper also intended to examine the repatronage intentions with chosen store formats. The hypothesised relationships among the major constructs were examined.

The study has revealed various path breaking findings which auger well for the voluminous growth and even development of retail formats in food &

grocery retailing in India. The study has elaborately discussed and considered various academic and managerial implications for food and grocery retail industry.

**Key Words:** Consumers, Retail, Behaviour, Food, Grocery

### Introduction

This paper deals with concepts and evolution of retailing; growth and development of global retailing; non-store retailing and special emphasis on Asia Pacific grocery retailing and exclusively focusing on Indian retailing in general and growth and development of food & grocery retailing in particular followed by an overview. Finally, this paper ends with stating the changing trends of store base grocery retail formats.

The word "Retail" is derived from the French Word "Retailer" meaning to 'cut a piece off' or 'to break bulk'. In simple terms this means a first-hand transaction with the customer. Retailing thus might be understood as the final step in the distribution of merchandise, for consumption by the end consumers. It thus consisted of all activities involved in the marketing of goods and services directly to the consumers for their personal, family or household use. Retailing involves a direct interface with the customer and the coordination of business activities from end to end- right from the concept or design stage of a product or offering, to its delivery and post-delivery service to the customer.

A revolution in the shopping habits of the people across the entire world had virtually brought the supermarket to the main street. This revolution was unparalleled in human history as it had en-

gendered the development of distribution system that delivers food and other products to the consumer in unprecedented abundance, variety and quality. It had gone through its natural process of evolution in all areas from the initial concept of the supermarket and department store to the hypermarket and shopping mall. It was believed that the first true department store in the world was founded in Paris in 1852 by Aristide Boucicaut and was named Bon Marche. Then, the department store business was a bare-bones operation. It was only after World War II that retailers in the West began to upgrade their services, facilities and merchandise selection to offer a fascinating array of additional benefits to consumers through organized retailing.

The latter half of the 20th Century, in both Europe and North America, has seen the emergence of the supermarket as the dominant grocery retail form. The reasons why supermarkets have come to dominate food retailing are not hard to find. The search for convenience in food shopping and consumption, coupled to car ownership, led to the birth of the supermarket. As incomes rose and shoppers sought both convenience and new tastes and stimulation, supermarkets were able to expand the products offered. The invention of the bar code allowed a store to manage thousands of items and their prices and led to 'just-in-time' store replenishment and the ability to carry tens of thousands of individual items. Computer-operated depots and logistical systems integrated store replenishment with consumer demand in a single electronic system. The superstore was born. On the Global Retail Stage, little has remained the same over the last decade. One of the few similarities with today is that Wal-Mart was ranked the top retailer in the world then and it still holds that distinction. Other than Wal-Mart's dominance, there's little about today's environment that looks like the mid-1990s. The Food Retail Industry in the Far East has evolved into what could be called 'the breeding ground' for emerging models with countries like Singapore being the home to some of the big players in the industry in these parts of the world. The presence of all the major players of the re-

tailing industry is found in Singapore. Singapore has 2 hypermarkets, one run by Carrefour and the other by Giant Hypermarket, part of Dairy Farm International. According to the government, there are more than 11,000 market stalls operating in 150 markets located all across Singapore Island. The markets further spread to China, Thailand, and Malaysia thanks to the major support that the local governments provided in creating the necessary regulatory framework in establishing their presence. Singapore, Malaysia and Thailand not only fueled the retail industry within the country, but also attracted hordes of tourists to experience the shopping "experiences" that they created in these islands. The market was also spread to the Gulf Cooperation Council (GCC), political and economic alliance of six Middle Eastern countries-Saudi Arabia, Kuwait, the United Arab Emirates, Qatar, Bahrain, and Oman.

#### Literature Review

The behaviour of shoppers differs according to the place where they are hopping and their involvement level with the act of shopping (Berman and Evans, 2005) and research has also shown that a relationship exists between environment and revenue in retail and service outlet stores (Milliman, 1982). The basic difference however continues to be the maturity of markets and formats. The basic difference however continues to be the maturity of markets and formats. While retail in the West has evolved in terms of formats over the past hundred years, organised retail in India is still a new phenomenon (Pradhan, 2007). Shopping is the act of identifying the store and purchasing the product. The behaviour of shoppers differs according to the place where they are shopping and their involvement level with the act of shopping (Berman and Evans, 2005). Shopping is a function of the nature of the product, the degree of perceived risk inherent in the product class and the level of knowledge or amount of information about alternatives. Observations of shopper behaviour in the store show that every purchase involves part or the whole of a process that follows a consistent pattern of See-Touch-Sense-Select.

Connolly et al., (1999) have classified shopping behaviours into three categories: a) blinkered mode in which shoppers confidently and efficiently zooming in on familiar brands, with no time or interest in logical label reading or studying product attributes, b) 'magpie' mode in which the shopper allows himself or herself to be distracted and attracted by different brands on display, and c) 'browser' mode in which the shopper behaving more rationally, reading the 'back of pack' copy and invariably comparing prices, ingredients, and seeking more information about product attributes, making piece-value comparisons across various brands.

There is a growing need to evaluate the true drivers of shopping behaviour in the Indian context (Sinha and Banerjee, 2004). The trade mark of Indian retailing, the small kirana shops with a high level of personalised service, is making shoppers reluctant to depart from traditional ways of shopping. The knowledge of consumer shopping behaviour is an essential input to the development of an effective marketing strategy, which is required for the effectiveness, and success of any business (Al-Rasheed et al., 2004). Past research and theories in consumer behaviour have often concentrated on consumer choice behaviour, particularly brand choice behaviour (Sheth, 1983).

Retail format choice and patronage have been widely studied across the world (Sinha and Banerjee, 2004, p.483). For many years, marketing researchers have considered issues related to consumers' retail format choice across various purchasing situations (Moore and Carpenter, 2006). From early studies that examine traditional retail format choice (Williams and Dadris, 1972) to recent inquiry into the non-traditional internet format choice (Keen et al., 2004), the marketing literature has identified several factors that are consumer-related and situational factors that impact retail format choice.

Shopping orientation could be defined as a shopper's style that places particular emphasis on a shopping-specific lifestyle encompassing shopping activities, interests and opinions, and reflecting a view of shopping as a complex social, recreational and economic phenomenon (Visser

and Preez, 2001). Shopping orientations are related to general predisposition toward acts of shopping. They are conceptualized as a specific dimension of lifestyle and operationalized on the basis of activities, interests and opinion statements pertaining to acts of shopping (Li et. al 1999).

Monroe & Guiltinan's retail patronage model was refined by Darden who emphasised the importance of enduring and stable shopping orientation determining a shopper's retail format choice (Darden et al., 1980). Darden (1980) developed the patronage model of consumer behaviour, which gave a comprehensive picture of patronage behaviour.

Terminal values, lifestyles, social class, and family were antecedents to shopping orientations. These antecedents with media habits and instrumental values also affected store attribute importance and the evoked store set. The second part of the model was triggered by a stimuli that set the needs queue in motion and started the information search that led to the evoked store set. The evoked store set then influenced store attribute importance leading to patronage intentions and patronage behaviour.

Soonhwa Choi (2000) developed a general model of retail patronage and empirically tested the relationships proposed in the model in the context of discount retail model. Findings of the study supported the hierarchical structure of variables proposed in the discount store patronage model. The results of the structural equation model indicated that consumer's socioeconomic class has strong effect on price perceptions, which are significantly and directly related to attitudes towards discount store shopping, and consequently discount store patronage patterns. Materialistic values and uniqueness desire were found to be positively associated with prestige sensitivity and preference for unique consumer products respectively, which again have influences on store attitude and patronage behaviour. The intervening roles of shopping orientation and store attitude confirmed the validity of the proposed model.

Sinha et al., (2005) developed a format choice of food and grocery retailer based on transaction utility model (Thaler, 1983). They applied con-

joint analysis and identified various store attribute utilities in the following hierarchy: ambience, accessibility, price, number of SKUs, type of merchandise, service mode and number of brands influencing retail format choice in the context of Indian food and grocery retailing.

Retail patronage issues have been engaging academic minds ever since the dawn of marketing as a scientific discipline (Bhatnagar, 1998). The ultimate goal of any business is to establish a loyal and profitable customer base in order to ensure future profits and longevity of the business (Grace and O'Cass 2005). Retail patronage describes whether or not respondents visit, spend money at, or shop at their main store (Chetthamrongchai and Davies, 2000). It also includes patronage intentions such as a willingness to recommend or buy, and shopping methods (Baker et al., 2002). Pan and Zinkhan (2006) identify a number of precursors to retail patronage, including quality and price; market relevance, such as store service; and personal factors, consisting of items such as demographics precursors of retail patronage. Repeat patronage or re-patronage extends the notion of patronage to predicting of loyalty outcomes (East et al., 2005).

The importance of examining retail format choice is fueled by the evolution of formats and frequency of cross shopping behaviours among consumers. The cross shopping concept was first discussed in the trade literature in the late 1970s (Cort and Dominguez, 1977). Over the past 25 years researchers have altered the formal definition of cross-shopping to represent different retail contexts. Cort and Dominguez (1977, p. 187) originally defined cross shopping as: when a single customer patronizes multiple types of retail outlets which carry the same broad lines of merchandise, are operated by a single firm, and are designed to appeal primarily to different target segments.

#### Objectives

1. To study the growth and development of food and grocery retailing in general and retail formats such as Neighbourhood Kirana Stores and Supermarkets in particular

2. To examine the effect of consumer characteristics (socio-economic, demographic, and psychographic) on retail format patronage decisions
3. To examine the effect of temporal aspects such as frequency of visit, purchase volume, and time spent in the store on retail format patronage behaviour
4. To examine the effect of store format attributes on retail format patronage
5. To investigate the effect of situational factors such as task definitions and perceived risk on retail format patronage
6. To derive marketing implications from the information gathered

#### Research Methodology

**Study Area:** The study area for the research was held in Bengaluru.

**Sample Size:** The sample size for the study was 100 respondents.

**Sampling Technique:** The sample techniques selected through the structured questionnaire was random sampling.

**Source and Type of Data:** Primary & Secondary data are the sources of data were collected from the respondents through interview, meeting & observation & earlier published journals, research papers & online articles.

**Research Instrument:** Questionnaire was the main instrument used in the data collection.

**Data Collating/Processing:** The data collection was then collated and analyzed using SPSS package.

#### Hypothesis

H10: Shopper characteristics are not the significant predictors of retail format choice decisions in relation to:

H10a: Age; H10b: Gender; H10c: Marital Status; H10d: Education, H10e: Occupation; H10f: Monthly Household Income; H10g: Family Size, H10h: Distance Travelled to store

H20: Shopper Psychographic variable do not have significant effect on retail format choice decisions.

H20a: Values; H20b: Activities; H20c: Interests; H20d: Opinions; H20e: Shopping orientations

H30: Temporal factors do not have significant association with retail format choice decisions in relation to:

H30a Shopping Frequency; H30b Purchase Volume; H30c Time Spent for Shopping

H40: Situational factors do not have significant impact on retail format choice decisions in relation to:

H40a: Task Definitions; and H40b: Perceived Risk

H50: Determinant store attributes do not have significant effect on retail format choice decisions in relation to:

H50a: Location; H50b: Merchandise; H50c: Customer service, H50d: Price - Promotion; H50e: Store ambience; and H50f: Store facilities.

H60: Store patronage decisions significantly affect re-patronage intentions in relation to:

H60a: Neighbourhood Kirana Store Formats; and H60b: Supermarkets Formats.

#### Data Analysis

All respondents were adult male and female food & grocery retail customers consisted of 50 female (58.6 percent) and 50 male (41.4 percent) with an average age of 32 years (range 20-62), modal age group 30-40 years and median age

was 35 years. The majority of the respondents (86.6 percent) were married and 13.4 percent were un-married. The major chunk of the respondents (56.4 percent) had graduation as their educational qualification and least 20 percent had SSC as their minimum qualification. The majority part of the respondents (38.4 percent) were encompass monthly household income INR 20,000 to INR 30,000, followed by (24.5 percent) with Rs. 10,000 to Rs. 20,000, (19 percent) of them were with the aggregated mean monthly household income was Rs 18,560 with 48.3 percent respondents had paid employment as their occupation and 29.8 percent of respondents are belongs to housewife category. The average family size of the respondents was 4.3, and 80 percent of them belonged to higher socio-economic class. A major chunk (33.4 percent) of the respondents had lived within half km from different retail store formats and about 61.3 percent had travelled up to 2 km for shopping food and grocery products. The majority of the respondents (55 percent) had owned two wheeler vehicles and 20 percent had owned four wheeler vehicles. The majority of the respondents (46.8 percent) are not using any transport, and 34.6 had used their own vehicle (two wheeler/four wheeler) for shopping food and grocery products.

Variable	Description	Perc ent	Mean	S.D
Gender	Male Female	41.4 58.6		
Age	20-30 Years 30-40 Years 40-50 Years 50-60 Years	29.1 36.6 24.8 9.5	32	8.96
Marital Status	Married Un-married	86.6 13.4		
Education	SSC/Diploma Degree PG & above	20.5 56.4 23.1		
Occupation	House wife Employment Business Others	29.8 48.3 14.0 7.9		

Monthly Household Income	< INR10000 INR10000-20000 INR20000-30000 > INR 30000	19 24.5 38.4 18.1	INR 18560	INR 6750
SEC	A B C	19.6 52.0 28.4		
Family size	1-3 3-5 5 & more	27.9 30.7 41.4	4.3	0.762
Purchase Volume	<INR3000 INR3000-4000 INR4000-5000 >INR 5000	174 163 128 115	INR 3,450	INR 680
Distance Travelled to Store	<1 Km 1-2 Kms 2-3 Kms 3-4 Kms >4 Kms	33.4 27.9 18.4 12.9 7.4	1.43	0.37
Mode of TransportUsed	Two wheeler Four wheeler Public/Private Transport None	19.3 15.3 18.6 46.8		

Source: Primary Data

#### Psychographic Factor Analysis

Factor analysis was conducted to reduce the number of variables for List of values (LOV), lifestyle (Activities, Interests and Opinions) and shopping orientations. Factor models were selected based on KMO (Kaiser-Meyer- Olkin) measures of sampling adequacy criteria (should be as near 1 as possible) which is a goodness of fit coefficient, Bartlett's test of shpericity (should be as close to 0 as possible) which is a badness of fit test, the Eigen values greater than 1 and amount of variance explained by the model. Each model was estimated using principal components analysis as the extraction method. Varimax with Kaiser Normalisation rotation method assisted in interpreting the data for list of value factors activity factors, interest factors, opinion factors and shopping orientation factors. Factors were labeled based on salient loadings. All loadings below 0.5 were dropped, and the factor analysis was recalculated. The Cronbach alpha was used to measure internal reliability by unit weighting items with

salient loadings in a factor. Results were discussed in the following paragraphs and summarized in respective tables.

#### List of values

Nine statements concerning a list of values which were derived from the LOV scale, was submitted to factor analysis with Varimax rotation. Three factors with eigenvalue greater than 1 emerged explaining 68.3 percent of the variance with a Kaiser - Meyer -Olkin (KMO) measure of sampling adequacy of 0.916, which is considered acceptable as it is near to 1. The application of Bartlett's test of shpericity clearly revealed that these factors are related at significance level. The scree plot also resulted in the acceptance of three factors with total variance of 68.3 percent. Factor one was labelled "joy seeker", factors two was labelled internally focused" and factor three was labelled "Dependent on others". Results of the individual loadings, Cronbach's alpha and variance explained with factor labels for LOV.

Factor Label	Statements	Factor Loding	Cronbach Alpha	Variance explained
Joy seeker	Exitement Fun & Enjoyment	0.705 0.648	0.721 0.703	24.3%
Intenally Focused	Self-respect Self-fulfilment	0.696 0.653	0.718	22.6%
Depended on other	Sens of belonging Warm relationships with other Security Accomplishment	0.714 0.689 0.638 0.523	0.703	21.4%

a. Extra Method: Principle Components Analysis, Ration Method: Varimax with Kaiser Normalisation, variance explained 68.3%, p=0.001

#### Life style factors

A total of 45 statements concerning lifestyle factors such as activities (16 statements), interests (17 statements) and opinions (12 statements) shown in question 2 in part-B were put to factor analysis. The five statements concerning activities were eliminated due to lowloadings such as "give or attend a dinner party" (0.320) "Go on a vacation" (0.313), "Go to a nightclub or dance" (0.326), "Engage in hobbies or "do-it yourself projects" (0.318), "I do enjoy making my own decisions" (0.434) and their Cronbach's alpha was 0.24. The

remaining eleven statements were reduced to three factors with eigenvalue greater than 1 and accounted for 72.5 percent variance and had Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy of 894 with Bartlett's tests of sphericity revealed that factors are related at significance level. The emerged factors were labeled as per variance explained are entertainment oriented, community oriented, sports oriented and business oriented. Results of the individual loadings, Cronbach's alpha and variance explained with factor labels for activities.

Faxtor Label expained	Statements	Factor Loading	Cronbac Alpha	Variance
Entertainment Oriented	Go to movies Reading books Listening to music	0.749 0.715 0.523	0.741	21.8%
Community Oriented	I am involved in social organization I am involved community projects	0.738 0.721	0.725	18.6%
Sports Enthusiast	I Play sports a lot I exercise regularly to stay fit Attend a sporting event	0.705 0.685 0.635	0.717	16.3%
Business Oriented	I am involved in a business organization Travel for business reasons Attend a charitable event	0.725 0.658 0.634	0.708	15.8

a.Extract Method: Principle Components Analysis, Rotation Method. Varimax with Kaiser Normalisation, total variance expained 73.6%, p=0.001

The seven statements concerning interests were eliminated due to low factor loadings such as "Other people usually follow my ideas" (0.482), "I spend a lot of time talking with my friends about shopping" (.381), "I purchase time-saving meals" (0.373), "I am a homebody" (.349), "Go to a festival" (0.347), "Visit an art gallery and/or museum" (0.354), "Dine out in a restaurant (0.347) and their Cronbach alpha was 0.528. The remaining ten statements were reduced to three factors with

an overall variance explained of 65.8 percent and had KMO measure of sampling adequacy of 0.936 with Bartlett's test of shpericity revealed that emerged factors are related at significance level. The emerged factors were labeled as per variance and loadings are innovative interests, leadership interests and socio-cultural interests. Results of the individual loadings, Cronbach's alpha and variance explained with factor labels for activities.

Factor label	Statements	Factor Loading	Cronbach Alpha	Variance explained
Innovative interests	I like doing things that are new and different I like to use new and different things in my lifetime I like the challenge of doing something that I have never done before	0.714 0.698 0.658	0.754	25.7%
Leadership interests	I like to lead others I like being in charge of group I usually organize people to get things done	0.574 0.709 0.692	0.705	22.4%
Socio-cultural	Visit or entertain friends or family regularly I entertain at home Give or attend a dinner party Attend a concert or play	0.662 0.681 0.649 0.610	0.727	17.7%

a. Extract Method: Principle Components Analysis. Rotation Method: Varimax with Kaiser Normalisation.  
Total variance exriance expalnied 65.8%. p=0.001

Factor label	Statements	Factor Loading	Cronbach Aplha	Variance explained
Family related	If it is good enough for my wife it is good enough for me also My family is the single most important thing to me I always take opinion of my family	0.763 0.662 0.650	0.718	27.6%
Autonornous related	I am more independent than most people I have more ability than the most people I think I have more self confidence than the most people	0.635 0.654 0.621	0.714	24.2%

Intellectual related	I feel confident In my ability to shop I have the ability to choose the right products What you think of your self is reflected by what you buy I consider myself an intellectual	0.771 0.720 0.685 0.649	0.685	21.8%
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a. Extract Method: Principle Components Analysis. Rotation Method: Varimax with Kaiser Normalisation.  
Total variance explained 73.6%, p=0.001

### Shopping Orientations

Respondents' shopping orientations were measured using thirty eight statements in the context of Indian food and grocery retailing. These were factor analysed using principle component analysis with varimax rotation. Six statements such as "I go for shopping to find value for money" (0.487), "I go shopping to have a look at products being considered for purchase" (0.436), "I am aware of fashion trends and want to be the first to try them" (0.427), "Sales persons add enjoyment to shopping" (0.402) and "Local stores are attractive places to shop" (0.381) were eliminated due to low loadings. Thirty three shopping orientation

statements were reduced to eight factors based on the criterion eigenvalue greater than 1 and examination of scree plot resulted in the acceptance of eight factors.

The eight factors explain 88.1 percent of the total variance and had KMO measure of sampling adequacy of 0.954 which is a satisfactory value nearing 1 with a Barlett's test of shpericity clearly indicated that emerged factors were related at significance level. The emergent factors were labeled as "Variety seeking", "Recreational shopper", "Time conscious shopper", "Local shopper", "Price conscious" and "Experience sharing".

Factor label	Statements	Factor Loading	Cronbach Alpha	Variance
Variety Seeking	I do shopping to keep up with trends I do shopping to see what new products are available I like to have a lot of variety in life I like to try new outlets	0.824 0.782 0.771 0.685	0.751	18.5%
Managing stress	I go shopping to make me feel better I feel relaxed after shopping shopping is fun I like to have excitement & fun in doing Shopping Shopping for pass	0.756 0.710 0.654 0.586	0.725	16.3%
Brand Conscious	I prefer to bye national brand name grocery products A well know brand means good quality I try to stick to certain brand and stores	0.689 0.634 0.610	0.716	14.8%
Local Shopper	I owe it to my community to shop at local stores Local stores offer me good products at low price Local store provide better service Local store take more interest in you	0.726 0.696 0.678 0.651	0.731	9.7%
Time Conscious	Shopping the store wastes my time I would like to finish shopping as soon as	0.712 0.705	0.685	12.5%

	possible I shop where it saves my time I usually buy from the nearest store I never seem to have enough time to do things I want to do	0.692 0.690 0.578		
Price Conscious	The price of product is good indicator of its quality Higher the price of products, higher is the quality Lowest price offers attracts me I buy as much as possible at discount prices I usually watch the advertisements for sales promotions	0.764 0.752 0.743 0.715 0.683	0.784	6.4%
Information Seeking	I often go shopping to get ideal though no intention of buying I generally seek help while shopping I would discuss with others before deciding on the purchase Check with other at the store about a new products	0.963 0.632 0.586 0.543	0.686	5.8%
Experience Seeking	I like to share my shopping experience with my friends Shopping would provide me social experiences outside home I like to go shopping with friends/family	0.654 0.598 0.531	0.635	4.1%

a. Extract Method: Principle Components Analysis. Rotation Method: Varimax with Kaiser Normalization, total variance explained 88.1%, p=0.001

#### Respondents Shopping Behaviour

Majority of the respondents (57 percent) revealed that they had always shopped food and grocery products from various retail formats for their household consumption. About 32 percent revealed that they had frequently shopped and the rest of 11 percent occasionally shopped food and grocery products from different retail formats.

Shopping behaviour	Frequency	Percent	Cumulative percent
Always	331	57.06	57.06
Frequently	186	32.08	89.14
Occasionally	63	10.86	100.00
Total	580	100.00	-

Source: primary data

#### Respondents retail format choice behaviour

Considering always value (5) and usually (4) on measurement scale, majority (57.59 percent) of the respondents had supermarket formats as their prime store formats for shopping food and gro-

cery products, followed by neighbourhood kirana store formats (42.41 percent). The results revealed that respondents involved in cross- shop-

ping behaviour among different store formats. It is implicit that respondents patronize booth kirana stores and supermarkets for a multiplicity of reasons. The results of retail format choice behaviour

towards neighbourhood kirana stores and supermarkets when customers are free to choose formats.

Retail Format Choice	Always (5)	Usually (4)	Occasionally (3)	Rarely (2)	Never (1)	Total
Kirana Store (N=580)	141	105	110	126	98	580
Supermarket (N=580)	188	146	128	75	43	580

Note: Respondents were not forced to choose one format over another

source: Primary Data

#### Purchase Pattern of Food and Grocery Products

About 40.86 percent of the respondents visited booth kirana stores and supermarkets more than once in a week for purchasing food and grocery products, out of which about 23.64 percent each for fortnightly and 21.7 percent once in month. Some 13.8 percent respondents purchased twice in week; 36.82 percent of the respondents likely to purchase once in a week from supermarket,

and 46.43 percent of the respondents likely to purchase once in a week from kirana stores. The chi-square results ( $\chi^2 = 25.2, df = 3, p = 0.038$ ) also revealed that there was a significant association between purchase frequency / pattern and type of store format. It was implicit from the findings that retail format choice decisions were dependent on purchase pattern. The results of purchase pattern / frequency for food and grocery products at given retail formats.

Purchase Pattern	Twice in week	Once in week	Once in fortnight	Once in month	Total
Kirana Store (N=580)	48	114	51	33	246
Supermarket (N=580)	32	123	86	93	334
Total	80	237	137	126	580

Source: Primary Data

#### Purchase Volume of Food and grocery Products

With an average spending of Rs. 3,450 per month on food and grocery products, majority (30.86 percent) of the respondents were in the category of less than Rs. 3,000. The standard deviation of the purchase volume was Rs. 680. The chi-square

statistic results ( $\chi^2 = 67.03, df = 3, p = 0.001$ ) also revealed that there was a significant association between purchase volume and type of store format. It was implicit from the findings that retail format choice decisions were dependent on purchase volume i.e. amount of purchase volume of food and grocery products per month.

Purchase Volume	<INR3000	INR3000-4000	INR4000-5000	>INR5000	Total
Kirana Store	106	67	41	32	246
Supermarket	68	96	87	83	334
Total	174	163	128	115	580

Source: Primary Data

About 63.27 percent of the respondents are spending less than 1 hour for their shopping needs in kirana stores and 50.29 supermarkets consumers spending less than 1 hour in purchasing of food and grocery products. The chi-square results ( $\chi^2 = 67.53$ , df = 4, p=0.000) also revealed that there was a significant association between

time consumers' spent for shopping and type of retail format. It was implicit from the findings that retail format choice decisions were dependent on time spent for shopping too. The results of time spent for shopping for food and grocery products at given retail formats.

Retail Format Choice	< 1/2 Hour	1/2 Hour to 1 Hours	1 Hour to 1 ½ Hours	1 ½ Hours to 2 Hours	>2 Hours	Total
Kirana Store (N=580)	113	86	24	13	10	264
Supermarket (N=580)	69	99	68	61	37	334
Total	182	185	92	74	47	580

Source: primary data

Critical store attributes were measured using different statements concerning food and grocery retail formats. Initially, Store attributes had 31 statements, but seven statements such as "Quality Store brands available" (0.479), "easy return purchase policy" (0.438), "credit card facilities are available" (0.412) "Everyday low pricing" (0.395), "Offering customer loyalty programs / club memberships" (0.386), "Product knowledge of sales personnel" (0.345) and "Store is stylish and fashionable" (0.356) were eliminated due to

low loadings. Finally, twenty four statements were reduced to six factors based on the criterion Eigen value greater than 1 and examination of scree plot resulted in the accepted of six factors. These six factors explain 86.4 percent of the total variance and had KMO measure of sampling adequacy of 0.982 which is the satisfactory value nearing 1 with a Barlett's test of Sphericity clearly indicated that emerged factors were related at significance level explained with factor labels for store attributes.

Factor label	Statements	Factor Loading	Cronbach Alpha	Variance
Location / Convenience	Convenient store location Convenient accessibility Convenient opening hours One-stop shopping convenience	0.745 0.732 0.698 0.653	0.762	21.6%
Merchandise	Good quality merchandise available Wider choice / variety of merchandise available Well known branded merchandise available Well known branded merchandise for the value of merchandise for the money	0.738 0.729 0.689 0.652	0.797	17.4%
Customer service	Fast checkout lines and prompt service Friendliness of sales personnel Offering value services Availability of sales personnel to respond to my requests/queries Offering personalized services	0.732 0.714 0.691 0.673 0.652	0.715	15.2%

Ambience Promotions	Store ambience lower prices High-Low price promotional offers offers Redemption of food voucher/discount coupons	0.734 0.697 0.631	0.708	13.7%
Store Facilities	Refreshment/entertainment facilities are available Provides comfortable (stress free) shopping parking facilities are available	0.713 0.710 0.657	0.698	8.2%

A. Extraction method: principle components analysis, rotation method: variance with Kaiser Normalization, variance explained 86.4%, p=0.001

#### Situational variables factor analysis

Situational variables had nine statements. Three statements, namely, "I want to get new ideas or know new products in the market" (0.452), "I perceived physical risk when chosen store delivers unsafe products and unsafe products and unsafe shopping experience" (0.428) and "I perceive time and convenience risk when it takes more time to find and purchase a product" (0.389) were eliminated due to low loadings. Rest of six statements was reduced to two factors based on the

criterion eigenvalue greater than 1 and examination of scree plot resulted in the acceptance of two factors. These two factors explain 71.2 percent of the total variance and had KMO measure of sampling adequacy of 0.861 which is a satisfactory value nearing 1 with a Barlett's test of sphericity clearly indicated that emerged factors were related at significance level 0.005,. The factor one labeled "Task definition" and the second factor.

Factor label	Statements	Factor Loading	Cronbach Alpha	Variance
Task Definition	I need something urgent to purchase I am about to purchase products in large quantities This is a routine job for me regular purchase	0.734 0.26 0.718	0.724	36.9%
Perceived Risk	I perceived performance risk when chosen store not delivered the expected benefits I Perceive financial risk when I have to pay more than necessary I perceive psychological risk when chosen store provides unpleasant shopping experience and low social status	0.708 0.686 0.648	0.752	34.3%

A. Extraction method: Principle Components Analysis ,Rotation Method: Variance with Kaiser Normalization, Variance Explained 75%, p=0.001

### Suggestions and Conclusion

The following are the suggestions:

- Though location and customer service are the forte of neighbourhood kirana retailers yet they need to augment customer services by introducing self-service rather over the counter (OTC).
- To address the consumer's see-touch-feel-select concept, it is necessary for kirana retailers to reorient their store design and layout (up gradation of stores) within the given size for better visibility of merchandise and keeping store neat and tidy.
- In the wake of changing consumer needs, tastes and preferences, it is suggested that kirana retailers should increase the product width and depth to retain existing customers and obviate competition from supermarket type store formats.
- Finally, kirana retailers should introduce more quality branded products in order to decrease consumer's perceived performance, physical and psychosocial risks.

The study examined the relationships among the constructs underlying consumer's retail format choice and repatronage outcomes for food and grocery retailing in India. Specifically, the study focuses on the following five questions: (1) Are shoppers' attributes able to influence the retail format choice decisions? (2) Do the determinant attributes of retail format exert any effect on retail format choice decisions? (3) Do the temporal elements have any conspicuous effect on retail format choice decisions? (4) What is the impact of situational factors on retail format choice decisions? (5) Does the choice of retail format affect repatronage intentions? The present findings contribute to the understanding of consumer store choice behaviour in food and grocery retailing in India, an area that has received scant attention within the academic literature. The overall results of this study show that, Indian food and grocery consumers have cross- shopping behaviour in nature. No single retail format seems to be prime in meeting consumer needs / wants. Consumers first choose a store format, and then move to a particular store within the format where they can

save time, money and effort. Hence, retaining customer allegiance to a particular retail format is posed as a major task. It is also found that consumers giving due concern to value for money, and see-touch-feel-select concept. Results also emphasize the need for a customized approach to retail marketing.

It is observed that store choice is a hierarchical process which depends on demographic attributes and current needs of a consumer. Findings from statistic also revealed that shopping trip pattern has significant relationship with choice of store formats. The following succinct conclusions are drawn:

1. The results revealed that consumer's age is one of the significant predictors of retail format choice and patronage in food and grocery retailing. 42 percent of the customers belonging to age group 30-40 years, mostly preferring supermarkets, whereas the age group of 40-50 years (30.89 percent) were privileged for neighbourhood kirana retail formats for shopping food and grocery products.
2. Significant differences are not found between male and female consumers towards retail format choice. Both neighbourhood kirana stores and supermarkets are equally preferred by male and female consumers. It is worth mentioning that gender does not have any effect on consumer's retail format choice decision.
3. Marital status of consumers does not have any effect on retail format choice decisions. Irrespective of marital status, grocery shopping seems to be routine and task oriented.
4. Consumer's level of education seems to be the significant predictor for choice of neighbourhood kirana, and supermarket formats. It is concluded that awareness and knowledge levels for information processing impacts the choice of formats.
5. Retail format choices differed among occupational categories. 58 percent of consumers from housewives, 57 percent from working category and 69 percent of business category respondents are patronising supermarkets and other category (pensioners and dependents) are preferring neighbourhood kirana stores. Consumers' occu-

pation is also one of the significant predictor for retail format choice decisions.

6. Consumer's monthly household income is also one of the determinants for choice of store formats. Higher income consumers belonging to INR 20,000 and above are more in favour of supermarket formats.

7. Much also depends on family size and its composition. Smaller households prefer neighbourhood kirana stores. 57 percent of consumers with household size 4 and above preferred the supermarkets. Consumer's household size affects choice of retail format.

8. It is worth noting that consumers attach high importance to store location, which highlights the significance of proximity in food and grocery retail format choice. It is concluded that consumers are seeking maximum convenience in food and grocery shopping. Hence, distance travelled to store for shopping grocery products also influences stores format choice decisions.

9. The present study has demonstrated that the personal values, lifestyle factors and shopping orientations serve as underlying consumer's psychographic determinants in segmenting grocery consumers as hedonic, utilitarian, autonomous, and conventional and socializations type.

10. Consumer Values, activates (communal, sports, business and entertainment), Consumer's interests (socio-cultural, innovative, and leadership), and opinions (family related, autonomous related and intellectual related) and shopping motives (variety seeking, recreational, brand conscious, time conscious, price conscious, experience seeking) proved to be the significant predictors of booth kirana and supermarket retail format choices.

11. Temporal elements such as shopping frequency, purchasing patterns, time spent for shopping proved to be the significant predictors of both kirana and supermarket retail format choices.

12. Situational factors also affect retail format choice decisions. Task definitions such as urgent purchase and short fill-ups are positively affecting neighbourhood kirana store formats. Regular and routine based tasks, purchasing bulk and

getting ideas, consumers prefer supermarket formats.

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### 3

## Measuring the Influence of Weather Variables on Productivity of Food-grain Crops in India: An Application of Just & Pope's Production Technique

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### Abstract

The present study investigates the impact of weather factors on mean yield and variability of food-grain crops during sowing, growing and harvesting time.

**Design/Methodology/Approach:** It used linear and log-linear regression models under stochastic production function technique. Mean yield and yield variability of wheat, chickpea, rice and maize crops are compiled as state-wise panel during 1971-2012.

**Major Findings:** It shows that mean yield and yield variability of food-grain crops are climate sensitive, and climate change have a negative impact on yield of aforesaid crops. It ascertained that fluctuation in weather factors would increase food insecurity in India.

**Research Limitations/Implications:** Agriculture is a significant cause for climate change and environmental degradation, however the study avoid this fact. It assumes that all varieties of a crop similarly get affects due to climate change.

**Practical Implications:** It emphasized that Indian farmers need to adopt crop specific policies to mitigate the adverse effects of climate change. It provides conclusive policy recommendations to moderate the negative effects of climate change in agriculture.

**Originality/Value:** It estimate the influence of climatic factors on mean yield and yield variability of major food-grain crops at macro level. It also assesses the seasonal influence of weather factors on food-grain productivity.

**Key Words:** Climate change; Non-climatic variables; Linear and log-linear regression model  
Mean yield and variability; Food-grain crops; India.

### Introduction

Climate is a historical weather condition of a particular place observed in several years. Weather is the state of atmospheric elements in relatively shorter time period of a geographical region. Temperature, rainfall, precipitation, cloud cover, humidity, solar radiation, sunshine and wind speed are the weather factors (Arndt et al., 2012; Kumar and Gautam, 2014). Climate of a region is helpful for farmers to choose crops production technologies and sowing time in cultivation (Paltasingh et al., 2012; Kumar and Gautam, 2014; Amin et al., 2015; Kumar et al., 2015b). Temperature, humidity and rainfall are the main drivers of crop growth (Arndt et al., 2012; Paltasingh et al., 2012; Kumar and Gautam, 2014). However, high variation in temperature and rainfall from normal have a negative impacts on crop production and agricultural practices (Gbetibouo and Hassan, 2005; Fischer et al., 2005; Mendelsohn et al., 2006; Arndt et al., 2012; Paltasingh et al., 2012; Kumar and Gautam, 2014; Lizumi and Ramankutty, 2015; Amin et al., 2015).

Accordingly, weather factors have a probability to increase or decrease crop production (Arndt et al., 2012; Paltasingh et al., 2012; Kumar and Gautam, 2014; Kumar et al., 2015b; Lizumi and Ramankutty, 2015; Kumar et al., 2016b). High

variability in weather factors have a negative implication on food security of dwellers in large agrarian economies (Lizumi and Ramankutty, 2015; Amin et al., 2015; Kumar et al., 2016b). There are several other inputs like arable land, soil fertility and quality, labour, high-yielding variety of seeds, fertilizer and pesticide, market structure, agricultural extension centres, irrigation facilities, modern techniques of farming, and farmer's experience have a critical impact on agricultural productivity (Paltasingh et al., 2012; Misra, 2014; Kumar et al., 2015b; Amin et al., 2015; Márza et al., 2015; Kumar et al., 2016b). Few factors can control by farmers, but weather is not (Paltasingh et al., 2012), therefore high variability in weather factors brought various issues for humanity at global level (Gbetibouo and Hassan, 2005; Fischer et al., 2005; Mendelsohn et al., 2006; Lizumi and Ramankutty, 2015).

Fluctuation in agricultural production due to variability in weather factors are critical concern. Around one billion people are undernourished in the world and 850 million malnourished persons live in developing countries (FAO Statistics, 2012). Extreme variation in weather factors brought more food insecurity, hunger and poverty in large agrarian and developing economies. Lack of technological advancement, inappropriate financial and physical resources to adapt the negative effect of climate change and high dependency of people on agriculture have increased more vulnerabilities in developing countries (Mendelsohn et al., 2006; Kumar et al., 2016a). As developing countries are located at lower latitudes, therefore these economies are more climate sensitive (Gbetibouo and Hassan, 2005; Mendelsohn et al., 2006; Lizumi and Ramankutty, 2015). Several studies have observed that crop yield is expected to decline in developing countries (Mendelsohn et al., 2006; Kumar and Gautam, 2014), consequently it would increase more disparities in cereal production among developed and developing countries (Fischer et al., 2005).

In India, most studies have shown that variability in weather factors would decrease agricultural

productivity, employment opportunities and food security (Hundal and Prabhjyot-Kaur, 2007; Paltasingh et al., 2012; Birthal et al., 2014; Singh et al., 2014; Kumar et al., 2014; Kumar and Sharma, 2014; Kumar and Gautam, 2014; Mondal et al., 2014; Birthal et al., 2014; Mondal et al., 2015; Kumar et al., 2015a,b,c; Kumar et al., 2016a,b). Several studies have concluded that climate change has negative impact on yield of food-grain and commercial crops. However, limited studies estimate the association of weather factors with mean yield of food-grain crops. In addition, few studies are used robust empirical model to evaluate the relationship between weather factors and mean yield and yield variability of crops in different stages of crop growth (Paltasingh et al., 2012; Lizumi and Ramankutty, 2015; Kumar et al., 2016b). Hence, it is indispensable to take this aspect also in empirically investigation to get an insightful idea for the impacts of weather factors on crop growth. Therefore, the present study explores the impact of weather factors on mean yield and yield variability of food-grain crops during sowing, growing and harvesting time. It focuses on following research questions:

- Which food-grain crop is more climate sensitive?
- What is association of weather factors with mean yield and yield variability of food-grain crops?
- Which weather factor does affect crop growth during sowing, growing and harvesting time?
- What could be adaptation techniques to mitigate the adverse effect of weather factors on crop growth?

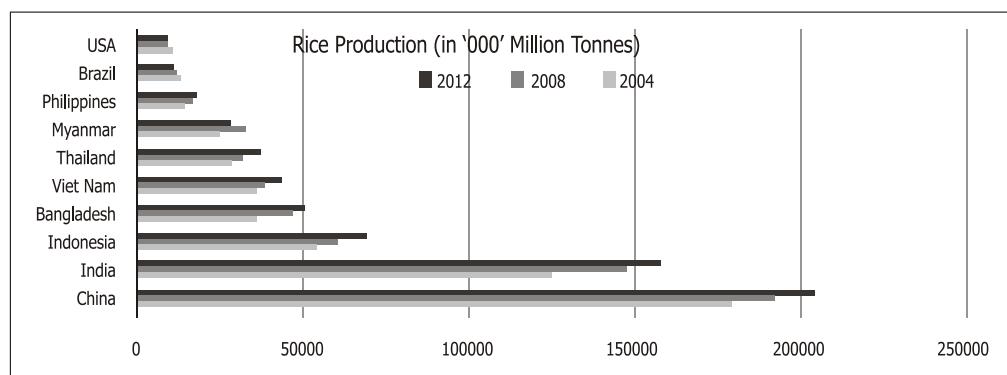
Relevant to said research questions the prime aim of the study is to assess the influence of weather factors on mean yield and yield variability of wheat, chickpea, rice and maize crops. Thereupon, it also identifies the seasonal influence of weather factors on mean yield and yield variability of said crops.

### India's position in Food-Grain Production

In India, food-grain farming play an important role to feed the world's second populated country. India has a dominant position in rice, maize, wheat and chickpea production in the world's larger agrarian economies like China and Brazil. It is second largest rice producing country of the world and occupies around 23% cropped area of India. In India, rice crop cultivates during Kharif and Rabi crop season (CMIE, 2012). Large Indian popula-

tion consume rice as a staple food-grain product. In 2012, China and India have first and second position respectively, which contributed 27.90% and 21.40% rice production respectively of the world (FAO Statistics, 2012). Figure: 1, demonstrates that India's position among ten top rice producing country in various years. It infers that China, India, Indonesia, Bangladesh and Vietnam are the five largest rice producing country in the world.

Figure 1: Top ten rice producing economies of the world

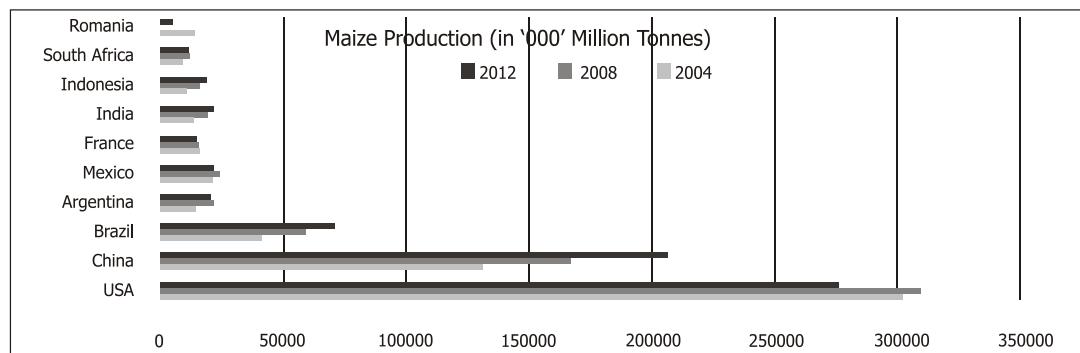


Source: FAO Statistics.

Maize is also an important food-grain crop which grows in most of agriculture intensive economies. In India, approximately 4.5% cropped area is used for maize cultivation every year (CMIE, 2012). Maize crop grows during Kharif season in India,

and India is the 5th largest maize producer which contributed 2.55% world's maize production in 2012 (FAO Statistics, 2012). USA, China, Brazil, Argentina and India are the five top maize producing country (see Figure: 2).

Figure 2: Top ten maize producing economies of the world

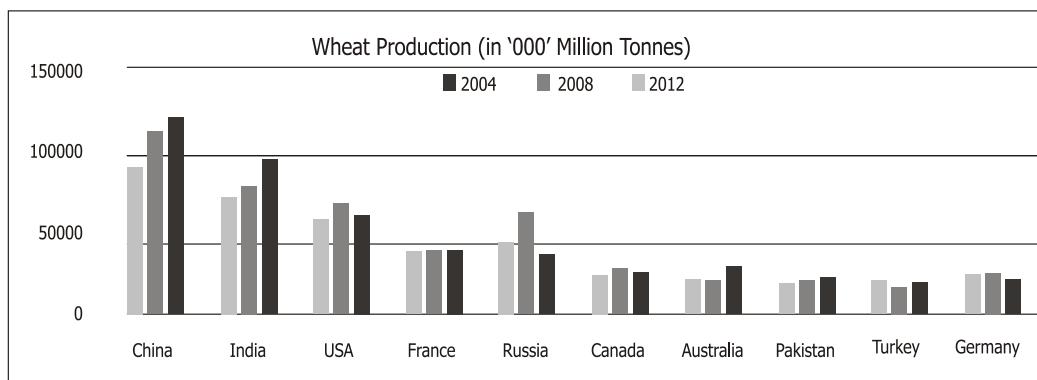


Source: FAO Statistics.

Wheat is most important food-grain crop, approximately 15.50% cropped area is using for wheat farming in India (CMIE, 2012). It is staple food-grain crop in China, USA, Russia, Canada, Australia, Pakistan, Turkey and Germany. China and

India have first and second position respectively in wheat production at global level (FAO Statistics, 2012). India has contributed around 14.13% share in world's wheat production in 2012 (FAO Statistics, 2012). India's position in wheat production is given in Figure: 3.

Figure 3: Top ten wheat producing economies of the world

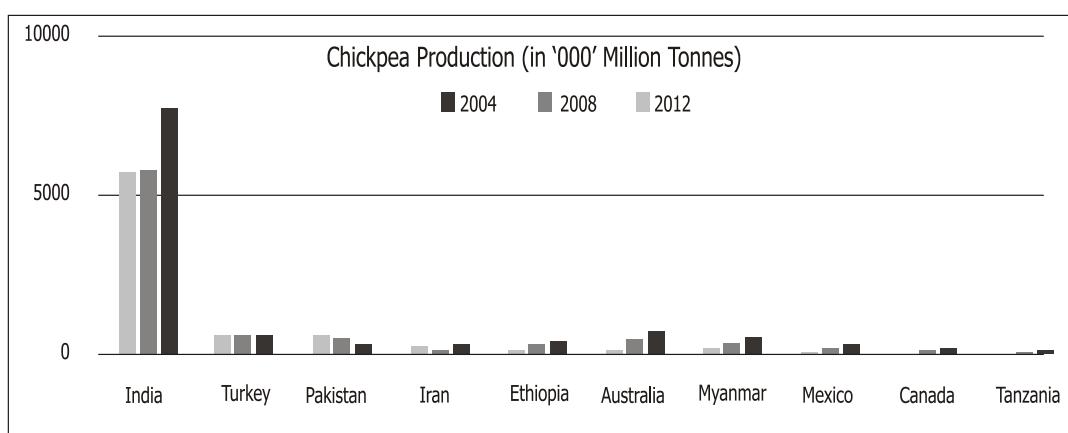


Source: FAO Statistics.

Chickpea is a cereal crop and meets the nutritional security to human. India is the largest producer of chickpea crop and contributes around 40% share in world's chickpea production (FAO Statistics, 2012). Chickpea crop cover about

4.24% arable area of India (CMIE, 2012). It also grows in Turkey, Pakistan, Iraq, Ethiopia, Australia, Myanmar, Mexico, Canada and Tanzania. India's position in chickpea production is given in Figure: 4.

Figure 4: Top ten chickpea producing economies of the world



Source: FAO Statistics.

## Material and Methods

### Brief description of study area and data sources

The present study comprises a time series of 42 years (1971-2012) data on yield of wheat, chickpea, rice and maize crops with weather factors and control variables. It complies panel of fifteen states of the country (i.e., Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Gujarat, Madhya Pradesh, Maharashtra, Rajasthan, Haryana, Punjab, Uttar Pradesh, Bihar, Odisha, West Bengal and Assam). Data on area sown, irrigated area, application of fertilizer and farm harvested price of crops are taken from Centre for Monitoring In-

dian Economy (CMIE). Information on weather factors like minimum temperature and maximum temperature, and rainfall are derived from the Indian Meteorological Department (GoI) database. Information on sowing, growing and harvesting time for crops are taken from the official website of the Indian Council of Agricultural Research (Crop Science Division) New Delhi. Minitab, SPSS and STATA statistical software are used to estimate the regression coefficients of weather factors and control variables in the planned empirical models. The brief explanation of the variables are presented in Table: 1.

Table 1: Brief description of dependent and explanatory variables

Symbol	Variables	Units	Brief description
lp	Output (Yield)	Kg./Ha.	Production/hectare land
as	Cropped sown	'000' Ha.	Cropped sown
ia	Irrigated area	'000' Ha.	Irrigated area
af	Application of fertilizer	Kg.	Utilization of fertilizer
fhp	Farm harvest price	Rs./Qtl.	Rupees at constant level with 1993-1994 prices
arfst	Rainfall	mm	Actual rainfall during sowing time
arfgt	Rainfall	mm	Actual rainfall during growing time
arfht	Rainfall	mm	Actual rainfall during harvesting time
amintst	Minimum temperature	°C	Average minimum temperature during sowing time
amintgt	Minimum temperature	°C	Average minimum temperature during growing time
amintht	Minimum temperature	°C	Average minimum temperature during harvesting time
amaxst	Maximum temperature	°C	Average maximum temperature during sowing time
amaxgt	Maximum temperature	°C	Average maximum temperature during growing time
amaxht	Maximum temperature	°C	Average maximum temperature during harvesting time

### Hypothetical outline of stochastic production function approach

Stochastic production function is a noteworthy functional framework to measure the risk decreasing or increasing inputs in crop production exploration (Just and Pope, 1979). The approach comprises production function as integration of two components, first is associated with output and second relating to variability in output (Koundouri and Nauges, 2005). These terms are known as deterministic and stochastic terms (Poudel et al., 2014) and these are mean yield and yield variability respectively (Koundouri and Nauges, 2005; McCarl et al., 2008; Kim and Pang, 2009; Cabas et al., 2010; Kumar et al., 2015b). The present study is given importance to aforesaid approach to examine the impacts of weather factors on mean yields and yield variability of food-grain crops. The approach contains response function and heteroskedastic error-term as:

$$Y_{it} = f(X_{it}, \beta) + \mu_{it} \quad (1)$$

$$Y_{it} = f(X_{it}, \beta) + h^{1/2}(X_{it}, a)\varepsilon_{it}; E(\varepsilon_{it})=0, Var(\varepsilon_{it})=1 \quad (2)$$

Here,  $Y_{it}$  is crop yield for state  $i$  and year  $t$ ;  $X_{it}$  is the vector of explanatory variables that contain weather and control variables.  $\mu_{it}$  is a heteroskedastic disturbance term with mean zero;  $\beta$  and  $\alpha$  are the vector of regression coefficient of corresponding variables.  $\varepsilon_{it}$  is a random error-term with mean zero and constant variance  $\sigma^2$ . In equation (2), 1st term,  $f(X_{it}, \beta)$  states the mean yield (deterministic) function and explained by independent variables ( $X_{it}$ ), 2nd term,  $h(X_{it}, \alpha)$  specifies the yield variability (stochastic) function that is related to  $X_{it}$  (Cabas et al., 2010). In this formulation weather and control variables have an independent influence on mean yield and yield variability of crops. If  $[\partial h/\partial X > 0]$ , input would be risk increasing; and if  $[\partial h/\partial X < 0]$ , input would be risk decreasing factor for yield variability (Kim and Pang, 2009; Carew et al., 2009; Aye and Ater, 2012; Kumar et al., 2015).

### Empirical Analysis

#### Formulation of Econometric Model

Cobb-Douglas production function model produces better results than other functional form (Just and Pope, 1979; Chen et al., 2004; Kumar

et al., 2015b; Kumar et al., 2016b). The present study is used linear and Cobb-Douglas production function model to capture the effect of weather and control variables on mean yield and yield variability of crop (Kim and Pang, 2009; Kumar et al., 2015b; Kumar et al., 2016b). Akaike Information Criterion (AIC) and Schwarz Information Criteria (SIC)/Bayesian Information Criterion (BIC)/Schwarz-Bayesian Information Criteria (SBIC) statistical techniques are applied to select a reasonable and consistent model (Kim and Pang, 2009; Kumar et al., 2016b). The model accepts that mean yield is a function of cropped area, irrigated area, application of fertilizer and farm harvest price and given as:

$$(lp)_{it} = \beta_0 + \beta_1(ttf) + \beta_2(as)_{it} + \beta_3(ia)_{it} + \beta_4(aft)_{it} + \beta_5(arfst)_{it} + \beta_6(arfgt)_{it} + \beta_7(arfht)_{it} + \beta_8(amintst)_{it} + \beta_9(amintgt)_{it} + \beta_{10}(aminttht)_{it} + \beta_{11}(amaxst)_{it} + \beta_{12}(amaxtgt)_{it} + \beta_{13}(amaxht)_{it} + \varepsilon_{it} \quad (3)$$

Here,  $lp$  is mean yield;  $i$  is cross-sectional state;  $t$  is time period (1971-2012);  $ttf$  is time trend factor that is included to capture the impact of technological change on output (Kim and Pang, 2009; Carew et al., 2009; Paltasingh et al., 2012; Kumar et al., 2015b; Amin et al., 2015).  $a$  is cropped area;  $i$  is irrigated area;  $aft$  is consumption of fertilizer;  $fhp$  is farm harvest price;  $arfsts$  is actual rainfall in sowing time;  $arfgt$  is actual rainfall in growing time;  $arfhts$  is actual rainfall in harvesting time;  $amintst$  is average minimum temperature in sowing time;  $amintgt$  is average minimum temperature in growing time;  $amintht$  is average minimum temperature in harvesting time;  $amaxst$  is average maximum temperature in sowing time;  $amaxtgt$  is average maximum temperature in growing time;  $amaxht$  is average maximum temperature in harvesting time;  $\beta_0$  is constant term;  $\beta_t$  is regression coefficient of time trend factor; and  $\beta_1 \dots \beta_{13}$  are regression coefficient of associated variables; and  $\varepsilon_{it}$  is error-term. Yield variance function is considered as:

$$(e^2)_{it} = a_0 + a_1(ttf) + a_2(as)_{it} + a_3(ia)_{it} + a_4(aft)_{it} + a_5(fhp)_{it} + a_6(arfst)_{it} + a_7(arfgt)_{it} + a_8(arfht)_{it} + a_9(amintst)_{it} + a_{10}(amintgt)_{it} + a_{11}(aminttht)_{it} + a_{12}(amaxst)_{it} + a_{13}(amaxtgt)_{it} + a_{14}(amaxht)_{it} + \mu_{it} \quad (4)$$

Here,  $(e^2)_{it}$  is the square of residuals that is estimated through equation (3);  $a_0$  is constant coefficient;  $ttf$  is time trend factor;  $a_1$  is regression coefficient of time trend factor;  $a_2 \dots a_{14}$  are the regression coefficients of corresponding variables; and  $\mu_{it}$  is random error-term in equation (4). While residuals are estimated as:

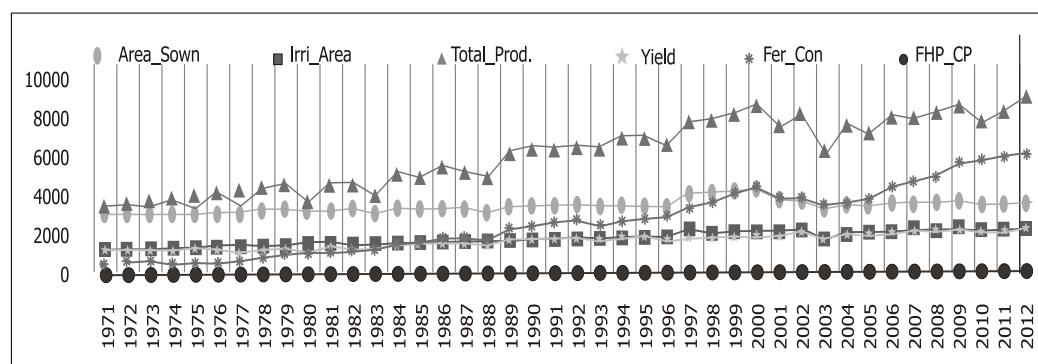
$$(e)_i = (lp)_i - \{\beta_0 + \beta_1(tif) + \beta_2(as)_i + \beta_3(ia)_i + \beta_4(af)_i + \beta_5(fhp)_i + \beta_6(arfst)_i + \beta_7(arfgt)_i + \beta_8(arfht)_i + \beta_9(amintst)_i + \beta_{10}(aminttg)_i + \beta_{11}(amintht)_i + \beta_{12}(amaxstt)_i + \beta_{13}(amaxtgt)_i + \beta_{14}(amaxtht)_i\} \quad (5)$$

Here, e is estimated residual for i th state during 1971-2012 (Kumar et al., 2015b). Natural logarithms of dependent and explanatory variables are included in the regression model under Cobb-Douglas production function approach.

#### Selection of PCSEs model

Existing studies claim that maximum likelihood estimation model produce better results than others under stochastic production function framework (Chen et al., 2004; McCarl et al., 2008; Kim and Pang, 2009). As our panel data for mean yield and yield variability function for all crops showed existence of heteroskedasticity, serial-correlation and auto-correlation. So, the study is given preference to Prais-Winsten models with panels corrected standard errors (PCSEs), Driscoll-Kraay standard errors (D-KSE) and feasible generalized least square estimations to investigate the regression coefficients (McCarl et al., 2008; Poudel et al., 2014; Kumar and Sharma, 2014; Kumar et al., 2014; Kumar et al., 2015a,b; Kumar et al., 2016a,b). As PCSEs model produces better results, thus we have presented results based on this model.

Figure 5: Trend in rice production and yield, and non-climatic variables



Note: The data for Figure: 5-12 are taken from Directorate of Economics, Statistics, Ministry of Agriculture (GoI) and Indian Institute of Tropical Meteorology (IITM) New Delhi; and Total Production is in '0000' tonne; Yield is in Kg/Hectare; Area Sown is in '0000' Hectare; Irrigated Area is in '0000' Hectare; Fertilizer Consumption is in '000'

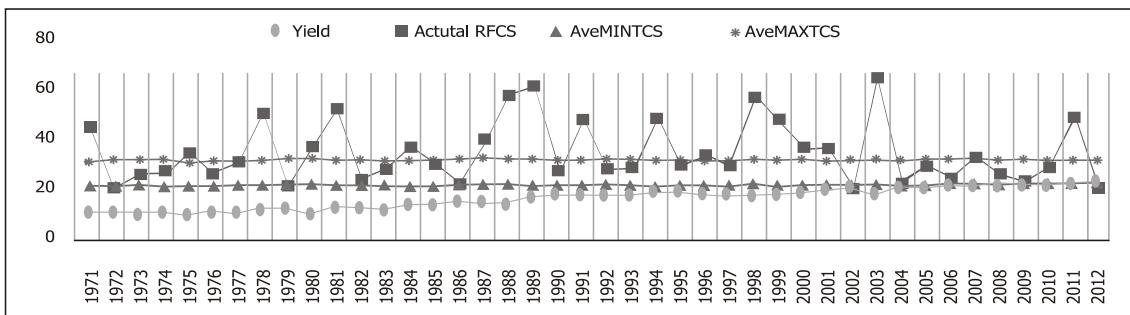
#### Descriptive Findings

##### Non-climatic, Climatic Factors and Rice Production in India

Trend in rice production and mean yield with respect to cropped area, irrigated area, application of fertilizer and farm harvest price is given in Figure: 5. It infers that rice production and yield are varied due to variation in cropped area, irrigated area, fertilizer consumption and farm harvest price. Results based on correlation coefficients indicate that rice production is positively associated with cropped area ( $r=0.817$ ), irrigated area ( $r=0.862$ ), farm harvest price ( $r=0.198$ ) and application of fertilizer ( $r=0.907$ ). Rice mean yield has positive association with irrigated area ( $r=0.439$ ), farm harvest price ( $r=0.393$ ) and application of fertilizer ( $r=0.495$ ). In contrary, rice mean yield has a negative relationship with cropped area ( $r=-0.029$ ) and implies that increase in cropped area would be ineffective to improve rice mean yield. Figure: 6, demonstrates the tendency in climatic factors with relation to rice mean yield.

Kg; Farm Harvest Price is in Rupees at constant level with 1993-1994 prices; Actual RFCS (Actual Rainfall during Crop Season) is in '0' mm; AveMINTCS (Average Minimum Temperature in Crop Season) is in '0C'; AveMAXTCS (Average Maximum Temperature in Crop Season) is in '0C'.

Figure 6: Trend in rice yield and climatic factors



#### Non-climatic, Climatic Factors and Maize Production in India

Figure: 7, presents that maize production and yield are fluctuated due to variability in cropped area, irrigated area, fertilizer consumption and farm harvest price. Estimated correlation coefficient recommended that total production is positively related with area sown ( $r=0.753$ ), irrigated area ( $r=0.686$ ), farm harvest price ( $r=0.355$ ), and application of fertilizer ( $r=0.871$ ). Maize mean yield

is also positively associated with irrigated area ( $r=0.329$ ), farm harvest price ( $r=0.443$ ) and consumption of fertilizer ( $r=0.396$ ). Estimates imply that maize yield has a high tendency to increase as cropped area, farm harvest price, application of fertilizer increase in maize farming. Cropped area could not be useful to increase maize yield. Figure: 8, show the trend in maize mean yield with respect to climatic factors during 1971-2012.

Figure 7: Trend in maize production, yield, and non-climatic variables

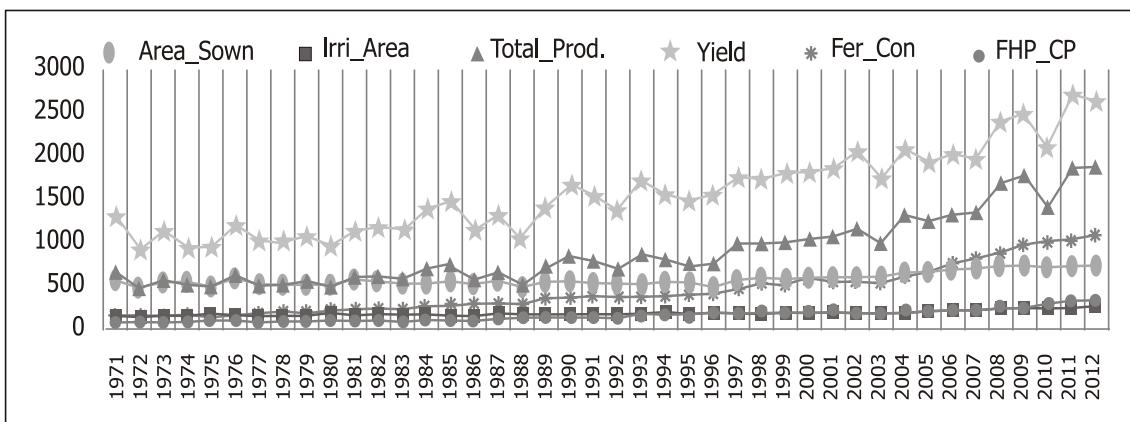
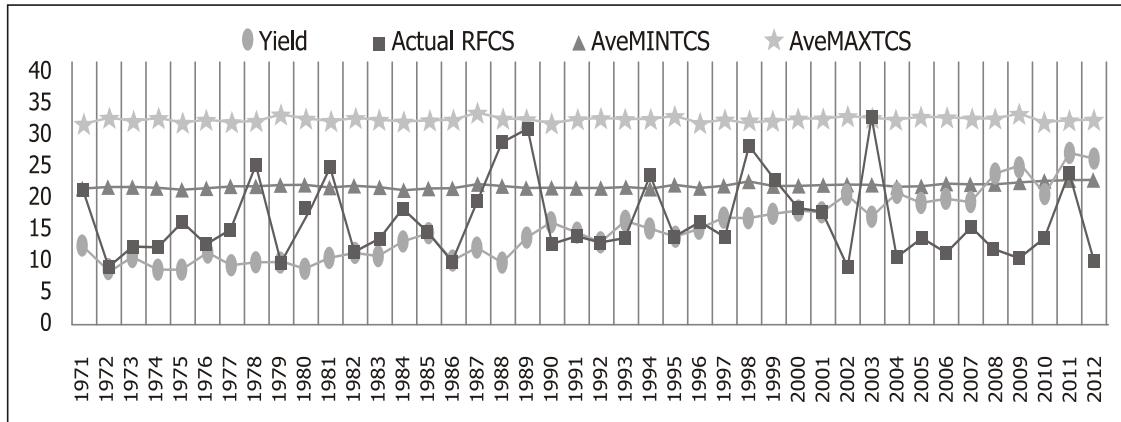


Figure 8: Trend in maize yield and climatic factors



#### Non-climatic, Climatic Factors and Wheat Production in India

Figure 9, presents the trend in wheat production and yield with respect to area sown, irrigated area, fertilizer and farm harvest price. Estimated correlation coefficients infer that wheat production has high propensity to increase as increase in area sown, irrigated area and fertilizer consumption in wheat farming. It would also improve with increase in farm harvest price. Wheat production has a positive and significant association

with area sown ( $r=0.918$ ), irrigated area ( $r=0.958$ ), application of fertilizer ( $r=0.154$ ) and farm harvest price ( $r=0.959$ ). Wheat mean yield has positive correlation with area sown ( $r=0.419$ ), irrigated area ( $r=0.499$ ), utilization of fertilizer ( $r=0.240$ ) and farm harvest price ( $r=0.598$ ). Figure: 10, also indicates the trend in wheat mean yield with regards to climatic factors.

Figure 9: Trend in wheat production, yield, and non-climatic variables

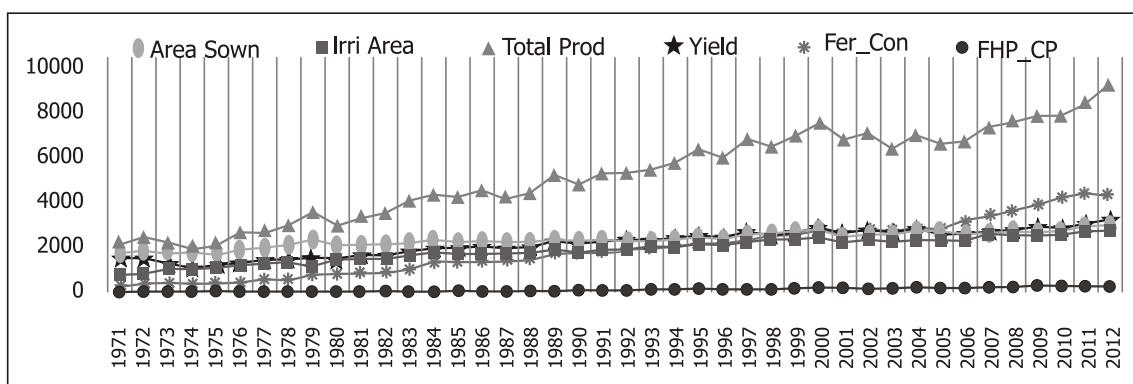
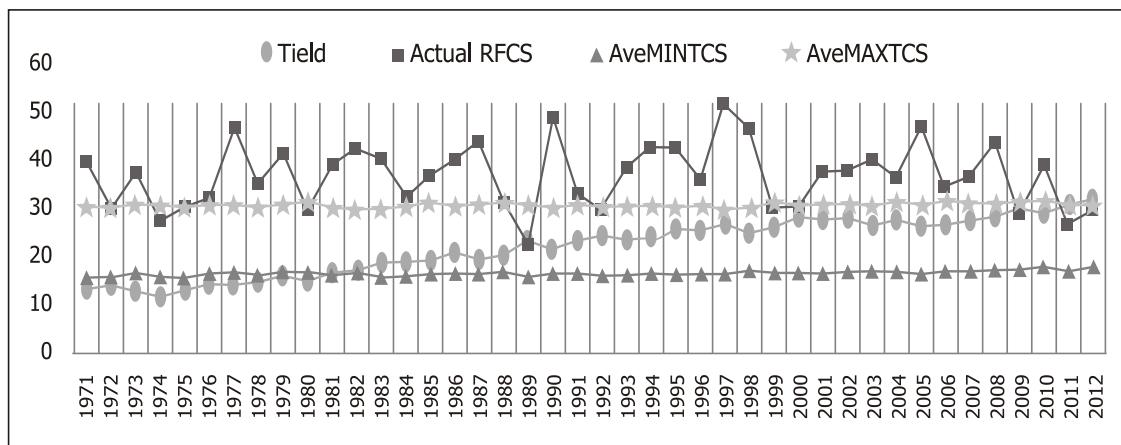


Figure 10: Trend in wheat yield and climatic factors



#### Non-climatic, Climatic Factors and Chickpea Production in India

Figure 11, shows the trend in chickpea production and yield with respect to cropped area, irrigated area, consumption of fertilizer and farm harvest price. It shows that chickpea production and yield is fluctuated due to variability in area sown, irrigated area, application of fertilizer and farm harvest price. Estimated correlation coefficients indicates that chickpea production has posi-

tive association with area sown ( $r=0.968$ ), irrigated area ( $r=0.893$ ), farm harvest price ( $r=-0.012$ ), and application of fertilizer ( $r=0.748$ ). Chickpea mean yield is positively related with area sown ( $r=0.172$ ), irrigated area ( $r=0.186$ ), farm harvest price ( $r=0.367$ ) and consumption of fertilizer ( $r=0.369$ ). Trend for chickpea mean yield and climatic factors isspecified in Figure: 12.

Figure 11: Trend in chickpea production, yield, and non-climatic variables

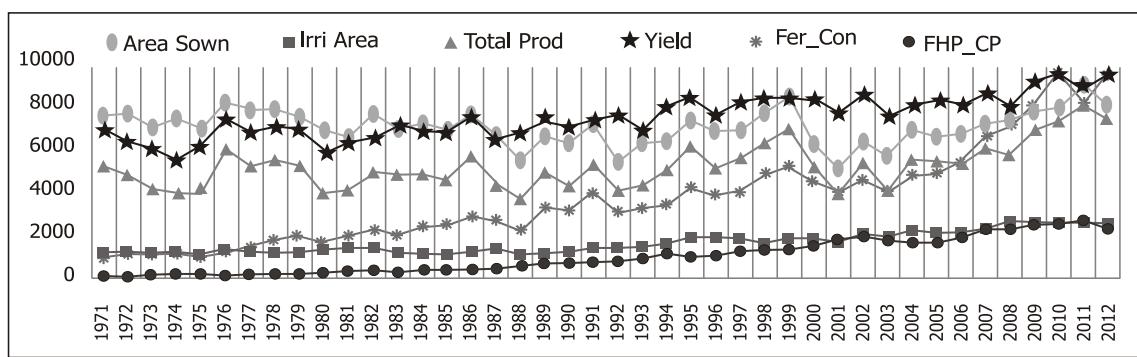
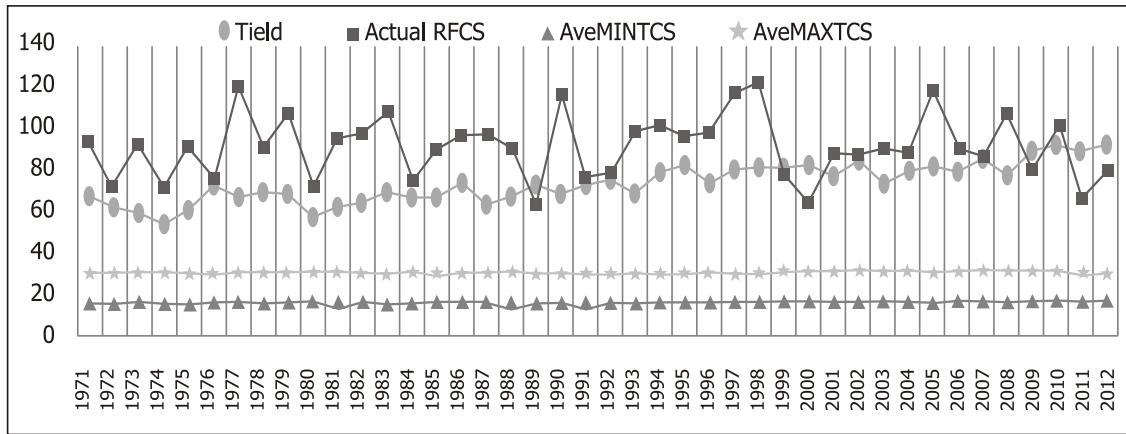


Figure 12: Trend in chickpea yield and climatic factors



### Empirical Results and Discussion

#### Regression results of mean yield of food grain crops

Regression results which investigate the impact of control and weather factors on mean yields of rice, maize, wheat and chickpea crops are given in equation 6-13. Log-linear regression model has a lowest value of AIC and BIC than linear regression model, therefore this model produce better and consistent results. Note: \*, \*\* and \*\*\* indicate that the regression coefficients of corresponding variables are statistically significant at 1%, 5% and 10% significance level respectively. While, N is number of observation, R<sup>2</sup> is coefficient of determination, AIC is the estimated value of Akaike Information Criterion statistics, BIC/SIC is the estimated value of Bayesian Information Criterion/Schwarz-Bayesian Information Criterion statistics, Mean VIF is the average value of all estimated variance inflation factors in all equations (6-21). The regression coefficient of time trend factor has positive impact on mean

yield of all crops. Estimates indicate that rice, maize, wheat and chickpea mean yield would increase as adoption of modern technologies in cultivation. Application of modern technology would reduce the adverse effect of weather factors in farming. Modern technologies can be used as change in cropping pattern, farm practices, seed replacement, planting of modern varieties of seed which are less climate sensitive, extension in irrigation areas, application of organic fertilizer, and transformation in land management policies (Paltasingh et al., 2012; Kumar, 2016a,b). Cropped area under rice and wheat crop has a negative impact on mean yield of these crops. In contrary, cropped area has a positive association with maize and chickpea mean yield. Estimates imply that maize and chickpea mean yield has a high possibility to be increased as cropped area increases.

#### Rice

$$\begin{aligned}
 (lp)_{it} = & -45516.52 + 24.813 * (ttf) - \\
 & 0.1940 * (as)_{it} + 0.381 * (ia)_{it} + 0.001 ** (af)_{it} + 0.051 * (fhp)_{it} + 0.001 * (arfst)_{it} - \\
 & 0.051 * (arfgt)_{it} + 0.004 * (arfht)_{it} - 311.173 * (amintst)_{it} + 110.440 * \\
 & (amintgt)_{it} + 29.751 * (amintht)_{it} + 92.250 * (amaxtst)_{it} + 67.767 ** (amaxtgt)_{it} - \\
 & 90.891 * (amaxtht)_{it} + e_{it} [(N=615) (R^2=0.671) (Wald Chi^2=1766.58) (AIC=-9283.168) \\
 & (BIC/SIC=-9349.493) (\text{Mean VIF}=3.57)] \quad (6)
 \end{aligned}$$

Rice

$$\begin{aligned} \log(lp)_{it} = & -4.654 * +0.007 * (ttf) -0.286 * \log(as)_{it} +0.333 * \log(ia)_{it} -0.017 \log(fhp)_{it} +0.375 * \log(af)_{it} - \\ & 0.058 * \log(arfst)_{it} -0.067 * \log(arfgt)_{it} -0.013 * \log(arfht)_{it} -2.466 * \log(amintst)_{it} - \\ & 0.300 \log(amintgt)_{it} +0.147 \log(amintht)_{it} +0.071 \log(amaxtst)_{it} +0.794 \log(amaxtgt)_{it} - \\ & 2.179 * \log(amaxtht)_{it} +\varepsilon_{it} [(N=615) (R^2=0.720) (Wald Chi^2=1508.96*) (AIC=-992.559) \\ & (BIC/SIC=-926.234) (\text{Mean } VIF=4.03)] \end{aligned} \quad (7)$$

Maize

$$\begin{aligned} (lp)_{it} = & -66461.41 * +38.031 * (ttf) -0.386 (as)_{it} +1.500 ** (ia)_{it} -0.227 (fhp)_{it} +0.004 (af)_{it} -0.003 \\ & (arfst)_{it} -0.179 * (arfgt)_{it} +0.004 (arfht)_{it} -172.281 * (amintst)_{it} -79.200 * (amintgt)_{it} +93.336 * \\ & (amintht)_{it} +177.455 (amaxtst)_{it} -141.717 * (amaxtgt)_{it} -145.682 * (amaxtht)_{it} +\varepsilon_{it} [(N=574) \\ & (R^2=0.535) (Wald Chi^2=751.48*) (AIC=-8995.534) (BIC/SIC=-9060.823) (\text{Mean } VIF=3.44)] \end{aligned} \quad (8)$$

Maize

$$\begin{aligned} \log(lp)_{it} = & -8.373 * +0.010 * (ttf) -0.225 ** \log(as)_{it} +0.020 \log(ia)_{it} -0.108 *** \log(fhp)_{it} - \\ & 0.040 \log(af)_{it} -0.133 * \log(arfst)_{it} -0.014 \log(arfgt)_{it} -0.046 * \log(arfht)_{it} -2.483 \log(amintst)_{it} - \\ & 2.705 * \log(amintgt)_{it} +1.116 * \log(amintht)_{it} +3.610 * \log(amaxtst)_{it} -2.562 * \log(amaxtgt)_{it} - \\ & 3.071 * \log(amaxtht)_{it} +\varepsilon_{it} [(N=574) (R^2=0.594) (Wald Chi^2=979.92*) (AIC=-562.535) \\ & (BIC/SIC=-497.245) (\text{Mean } VIF=3.79)] \end{aligned} \quad (9)$$

Wheat

$$\begin{aligned} (lp)_{it} = & -49976.59 * +29.5112 * (ttf) -0.0339 (as)_{it} -0.0970 (ia)_{it} +0.1666 (fhp)_{it} +0.0024 ** (af)_{it} - \\ & 0.2120 * (arfst)_{it} -0.7304 * (arfgt)_{it} -0.6953 * (arfht)_{it} +56.9590 * (amintst)_{it} - \\ & 78.1970 * (amintgt)_{it} +120.186 * (amintht)_{it} +45.8803 ** (amaxtst)_{it} -281.1073 * (amaxtgt)_{it} - \\ & 79.2319 * (amaxtht)_{it} +\varepsilon_{it} [(N=574) (R^2=0.7526) (Wald Chi^2=1168.40*) (AIC=-8785.733) \\ & (BIC/SIC=-8851.023) (\text{Mean } VIF=7.30)] \end{aligned} \quad (10)$$

Wheat

$$\begin{aligned} \log(lp)_{it} = & -3.032 * +0.005 * (ttf) -0.093 ** \log(as)_{it} +0.141 * \log(ia)_{it} -0.007 \log(fhp)_{it} - \\ & 0.022 \log(af)_{it} -0.023 * \log(arfst)_{it} -0.003 \log(arfgt)_{it} -0.0212 *** \log(arfht)_{it} -0.565 * \log(amintst)_{it} - \\ & 0.606 ** \log(amintgt)_{it} +1.427 * \log(amintht)_{it} +1.421 * \log(amaxtst)_{it} -3.508 * \log(amaxtgt)_{it} - \\ & 1.815 * \log(amaxtht)_{it} +\varepsilon_{it} [(N=574) (R^2=0.770) (Wald Chi^2=1746.43*) (AIC=-702.770) \\ & (BIC/SIC=-637.480) (\text{Mean } VIF=10.73)] \end{aligned} \quad (11)$$

Chickpea

$$\begin{aligned} (lp)_{it} = & -14759.08 * +7.9872 * (ttf) -0.0258 (as)_{it} +0.0015 (ia)_{it} -0.0428 (fhp)_{it} +0.0031 * (af)_{it} - \\ & 0.0267 (arfst)_{it} -0.0847 (arfgt)_{it} -0.1374 * (arfht)_{it} +4.2413 (amintst)_{it} -9.2587 * (amintgt)_{it} - \\ & +31.2890 * (amintht)_{it} -3.3419 (amaxtst)_{it} -37.4089 * (amaxtgt)_{it} +3.0708 (amaxtht)_{it} +\varepsilon_{it} [(N=574) \\ & (R^2=0.4747) (Wald Chi^2=636.05*) (AIC=-7462.336) (BIC/SIC=-7527.626) (\text{Mean } \\ & VIF=6.22)] \end{aligned} \quad (12)$$

## Chickpea

$$\begin{aligned}
 \log(lp)_{it} = & -7.637* +0.005*(ttf)+0.028\log(as)_{it}+0.015\log(ia)_{it}-0.157*\log(fhp)_{it} \\
 & +0.091\log(aq)_{it}-0.008\log(arfst)_{it}+0.008\log(arfgt)_{it}-0.001\log(arfht)_{it}-0.170\log(amintst)_{it} \\
 & +0.036\log(amintgt)_{it}+0.323\log(amintht)_{it}+0.183\log(amaxtst)_{it}- \\
 & 1.811*\log(amaxtgt)_{it}+1.502*\log(amaxtht)_{it}+\varepsilon_{it} [(N=574) (R^2=0.470) (Wald Chi^2=1746.43*) \\
 & (AIC=-930.206) (BIC/SIC=-864.917) (\text{Mean VIF}=7.15)](13)
 \end{aligned}$$

As irrigation area is positively associated with mean yields of these crops. Thus it is a crucial factor to increase rice, maize, wheat and chickpea mean yield. Farm harvest price is negatively related with rice, maize, wheat and chickpea mean yields. Estimates can be interpreted that these are major food-grain crops and perception of farmers would be unchanged with price variation. Consumption of fertilizer has a positive effect on rice, wheat and chickpea mean yield. It shows that consumption of fertilizer can increase the yield of these crops. Application of fertilizer would be effective in those areas in which farmers are using less fertilizer, otherwise it would decrease quality of environmental factors like soil and water quality, and air quality (Kumar et al., 2014; Kumar et al., 2016a,b). It can also increasesmore water requirement for irrigation in farming (Kumar and Gautam, 2014).Furthermore, estimates indicate that actual rainfall during sowing, growing and harvesting time are observed negative influence on mean yield of rice, maize, wheat and chickpea crop. These results can be interpreted in two ways: first, high rainfall can decrease cropped area, and second plant growth may decline and seed can lost due to splash effects.

Rainfall during growing time has positive influence on chickpea mean yield. Vegetation growth of crop can decline due to high rainfall, therefore rainfall during growing time shows negative impact on mean yields of these crops.Crops growth might be affected due to uncertainty in rainfall or changing rainfall pattern during growing time of crops (Kumar et al., 2016a). Actual rainfall during harvesting time have a negative impact on mean yield of rice, maize, wheat and chickpea. In harvesting time the crops are final stage of production and rainfall during this time would decrease total output, quality and actual nutrition

content. Thus, it is concluded that excessive and uncertainty inrainfall would be harmful for yield of food-grain crops. Average minimum temperature during sowing time is seen negative effect on mean yield of rice, maize and chickpea crops. Average minimum temperature during sowing time have positive association with wheat mean yield. It implies that wheat crop is required low minimum temperature during seed germination. Average minimum temperature during growing time has a negative association with mean yield of rice, maize and wheat.Estimates give confirmation that these crops are needed minimal minimum temperature for plant growth. However, minimum temperature during harvesting time would be helpful to increase yield of all crops. Maximum temperature during sowing time is positively associated with rice, maize, wheat and chickpea yield. While, maximum temperature during growing time is appeared negative effect on mean yields of maize, wheat, chickpea. Furthermore, maximum temperature during harvesting time is performed negative influence on rice, maize and wheat mean yield. Estimates imply that these crops are required temperature between 32-38°C during harvesting time to produce higher production. Here, it can be arguedthat weather factors during various stages of crop growth has a significant influence on mean yield of these crops. Regression results of yield variability of food-grain crops

Empirical results that estimates the influence of weather and control factors on yield variability of food-grain crops are presented in equation (14-21). Time trend factor shows a negative effect on yield variability of maize, wheat and chickpea. It implythat adoption of modern technology would be risk decreasing input for these crops. Maize yield variability would be in risk due to application

of modern technology in maize crop farming. In contrary, rice yield variability does not found statistically significant association with time trend factor. Cropped area, irrigated area and farm harvest prices are witnessed statistically insignificant relationship with yield variability of these crops.

Thus, it is reasonable to accept that yield variability of these crops would be ineffective with increase in cropped area, irrigated area and farm harvest price. However, application of fertilizer is negatively associated with rice yield variability, which indicates that utilization of fertilizer would reduce yield variability of rice.

Rice

$$(e^2)_{it} = -834819.6 + 205.823(ttf) - 58.998(as)_{it} + 95.462(ia)_{it} - 18.997(fhp)_{it} - 0.8561^{***}(af)_{it} - 1.4072(arfst)_{it} - 20.4219(arfgt)_{it} - 1.0178(arfht)_{it} + 23350.46(amintst)_{it} + 74782.85^{*}(amintgt)_{it} + 7506.53(amintht)_{it} - 22673.44^{*}(amaxtst)_{it} - 9157.358(amaxtgt)_{it} - 20455.51^{***}(amaxtht)_{it} + \varepsilon_{it} [(N=615) (R^2=0.1115) (Wald Chi^2=111.20*) (AIC=-17437.29) (BIC/SIC=-17503.61) (Mean VIF=3.49)] \quad (14)$$

Rice

$$\log(e^2)_{it} = -0.2674 + 0.001(ttf) + 0.037\log(as)_{it} - 0.207\log(ia)_{it} + 0.125\log(fhp)_{it} - 0.778^{***}\log(af)_{it} + 0.019\log(arfst)_{it} - 0.381^{***}\log(arfgt)_{it} + 0.159^{***}\log(arfht)_{it} + 4.857\log(amintst)_{it} + 10.639^{**}\log(amintgt)_{it} + 0.181\log(amintht)_{it} - 4.679^{***}\log(amaxtst)_{it} - 3.754\log(amaxtgt)_{it} - 6.5689^{**}\log(amaxtht)_{it} + \varepsilon_{it} [(N=615) (R^2=0.0919) (Wald Chi^2=104.09*) (AIC=-1649.289) (BIC/SIC=-1715.614) (Mean VIF=4.03)] \quad (15)$$

Maize

$$(e^2)_{it} = -3.19e+07* + 15893.54^{*}(ttf) - 883.319^{***}(as)_{it} + 1858.342(ia)_{it} + 529.499^{**}(fhp)_{it} + 6.554(af)_{it} - 4.512(arfst)_{it} - 130.056^{***}(arfgt)_{it} + 123.2316(arfht)_{it} + 50821.54^{***}(amintst)_{it} - 51447.97^{***}(amintgt)_{it} + 72992.52^{**}(amintht)_{it} + 7987.429(amaxtst)_{it} + 10861.800(amaxtgt)_{it} - 40219.33^{**}(amaxtht)_{it} + \varepsilon_{it} [(N=574) (R^2=0.205) (Wald Chi^2=78.27*) (AIC=-17093.48) (BIC/SIC=-17158.77) (Mean VIF=3.44)] \quad (16)$$

Maizelog

$$\log(e^2)_{it} = -27.1936* + 0.009*(ttf) + 0.724\log(as)_{it} + 0.067\log(ia)_{it} + 0.591\log(fhp)_{it} - 0.812\log(af)_{it} + 0.180^{***}\log(arfst)_{it} - 0.250\log(arfgt)_{it} - 0.074\log(arfht)_{it} + 0.676\log(amintst)_{it} + 0.452\log(amintgt)_{it} + 2.593^{**}\log(amintht)_{it} - 2.408\log(amaxtst)_{it} + 5.442\log(amaxtgt)_{it} - 1.3185\log(amaxtht)_{it} + \varepsilon_{it} [(N=574) (R^2=0.075) (Wald Chi^2=57.34*) (AIC=-1523.377) (BIC/SIC=-1588.667) (Mean VIF=3.79)] \quad (17)$$

## Wheat

$$(e^2)_{it} = -9614619* + 5386.306*(ttf) + 58.006(as)_{it} - 109.435*(ia)_{it} + 65.077(fhp)_{it} - 1.765****(af)_{it} - 14.815(arfst)_{it} - 161.634(arfgt)_{it} + 126.230*(arfht)_{it} + 40774.89*(amintst)_{it} - 2049.141(amintgt)_{it} - 39193.590*(amintht)_{it} - 39379.850***(amaxtst)_{it} - 64086.010*(amaxtgt)_{it} + 62993.46*(amaxhtt)_{it} + \varepsilon_{it} [(N=574) (R^2=0.1847) (Wald Chi^2=96.96*) (AIC=-16253.08) (BIC/SIC=-16318.37) (Mean VIF=7.30)] \quad (18)$$

## Wheat

$$\log(e^2)_{it} = 24.140** - 0.011***(ttf) - 0.091\log(as)_{it} + 0.098\log(ia)_{it} - 0.402\log(fhp)_{it} - 0.064\log(af)_{it} - 0.012\log(arfst)_{it} - 0.012\log(arfgt)_{it} - 0.0112\log(arfht)_{it} + 2.014**\log(amintst)_{it} + 1.458\log(amintgt)_{it} - 1.365\log(amintht)_{it} - 4.894***\log(amaxtst)_{it} - 4.758\log(amaxtgt)_{it} + 4.716\log(amaxhtt)_{it} + \varepsilon_{it} [(N=574) (R^2=0.040) (Wald Chi^2=27.87*) (AIC=-1665.627) (BIC/SIC=-1730.917) (Mean VIF=10.73)] \quad (19)$$

## Chickpea

$$(e^2)_{it} = -802.985 + 539.722*(ttf) - 4.119(as)_{it} + 10.221(ia)_{it} + 6.202(fhp)_{it} + 0.362(af)_{it} + 4.780(arfst)_{it} - 37.2051****(arfgt)_{it} - 6.019(arfht)_{it} + 776.246(amintst)_{it} - 742.546(amintgt)_{it} + 4967.793*(amintht)_{it} + 3466.864****(amaxtst)_{it} - 1236.257(amaxtgt)_{it} - 802.985(amaxhtt)_{it} + \varepsilon_{it} [(N=574) (R^2=0.074) (Wald Chi^2=41.45*) (AIC=-14076.50) (BIC/SIC=-14141.79) (Mean VIF=6.22)] \quad (20)$$

## Chickpea

$$\log(e^2)_{it} = 1.577 - 0.006****(ttf) - 0.592\log(as)_{it} - 0.001\log(ia)_{it} + 0.499\log(fhp)_{it} + 0.758\log(af)_{it} - 0.068\log(arfst)_{it} - 0.074\log(arfgt)_{it} + 0.021\log(arfht)_{it} + 2.566\log(amintst)_{it} - 0.590\log(amintgt)_{it} + 1.779\log(amintht)_{it} + 1.390\log(amaxtst)_{it} + 0.573\log(amaxtgt)_{it} + 0.633\log(amaxhtt)_{it} + \varepsilon_{it} [(N=574) (R^2=0.046) (Wald Chi^2=42.47*) (AIC=-1628.598) (BIC/SIC=-1693.887) (Mean VIF=7.15)] \quad (21)$$

Few weather factors has statistically significant impact on yield variability of these crops. Actual rainfall during sowing time has a positive association with maize yield variability. It infers that it would be risk increasing input for maize yield variability. Rainfall in growing time is observed a negative impact on yield variability of rice. It express that rainfall would be risk decreasing input for rice yield variability. Actual rainfall during

harvesting time shows a positive association with rice yield variability. It would be risk increasing input for rice yield variability. Maize yield variability is negatively impacted due to rainfall during sowing time and demonstrates that it would be risk decreasing input for this crop. Positive association of minimum temperature during sowing time with wheat yield variability, shows that it is

risk increasing input for wheat crop. Minimum temperature during growing time is seen risk increasing input for rice yield variability. Minimum temperature during harvesting time is measured risk increasing input for maize yield variability. Furthermore, maximum temperature during sowing, growing and harvesting are expected risk decreasing input for rice yield variability. Maximum temperature during sowing time is found risk decreasing input for what yield variability. Remaining weather factors do not have statistically significant association with yield variability of crops.

#### Conclusion and Policy Suggestions

The present study estimates the impact of weather factors on mean yield and yield variability of rice, maize, wheat, chickpea crops in India. The regression of explanatory variables are estimated using linear and log-linear regression models under stochastic production function technique. It compiled 42 years (1971-2012) data on mean yield and yield variability of major food-grain crops, and weather and control variables. It comprises agrarian states of India as state-level panel. Empirical results of the study demonstrate that variability in weather factors like actual rainfall, maximum and minimum temperature during sowing, growing and harvesting time have negative and significant influence on mean yield and variability of food-grain crop. The weather impact on mean yield and variability of food-grain crops varies across crops and within seasons. Estimates imply that mean yield of food-grain crops are climate sensitive in India. Mean yield and yield variability of undertaken crops are significantly influenced due to fluctuation in maximum and minimum temperatures, and rainfall pattern. It accomplished that climate change adversely affects yield of aforesaid crops. Hence, it ascertained that fluctuation in weather factors would have negative implications on food security.

Present study provides several policy suggestions to mitigate the negative consequences of climate change on crop farming. It recommended that Indian farmers need to adopt crop specific policies to mitigate the adverse effect of climate change in agriculture. It is essential to develop strategies to reduce yield variability of these crops.

Otherwise, it would be a serious threat to sustain food security and rural development (McKune et al., 2015). Fluctuation in total production due to yield variability may be challenging for producers and consumers (Kumar et al., 2015b). High yield variability would be caused to collapses of government development policies, food price instability and market structure (Kim and Pang, 2009; Kumar et al., 2015b). High yield variability of crops would reduce farmer's income (Khajuria and Ravindranath, 2012). Therefore, Indian policy makers are desirable to give more attention towards risk increasing and decreasing inputs in crop farming (Kumar et al., 2015b). Planting technique of crops, selection of appropriate genotype (Birthal et al., 2014; Kumar et al., 2015b), applying modern technologies, application of bio-fertilizer and appropriate irrigation facilities in cultivation would be imperative to reduce negative impact of weather factors in agriculture (Singh et al., 2014; Mondal et al., 2015).

Mixed cropping system or dual cropping policy would be useful to improve agricultural productivity. Crop diversification would be crucial option to reduce risk in crop production induced by climate change (Misra, 2014; Kumar et al., 2015b). Farmers can give importance modern varieties of seed which are less sensitive to climatic change (Birthal et al., 2014).

The Government of India must provide high yielding varieties of seed, credit accessibility, proper irrigation facilities, bio-fertilizer and modern technology to farmers (Kumar et al., 2016a,b). Water harvesting and water conservation, and efficient use of water through micro-irrigation techniques like sprinkler and drip irrigation could be essential technique (Birthal et al., 2014; Misra, 2014; Kumar and Gautam, 2014; Kumar et al., 2016a,b). Well-organized land strategy and sustainable land management schemes would be helpful to sustain agricultural production. Crop insurance policies would increase farmer's economic capacity to adopt new techniques in cultivation (Birthal et al., 2014; Mondal et al., 2014; Marza et al., 2015). Agriculture is a significant contributor to global GHG emission (Khajuria and Ravindranath, 2012), therefore it is a cause for climate change and

environmental degradation. Conversely, agricultural sector is negatively influenced due to variability in weather factors. Hence, the study is strongly argued that world's economies are compulsory to develop alternative techniques to reduce GHGs emission from various sectors (Kumar and Gautam, 2014; McKune et al., 2015; Kumar et al., 2015d). Additionally, the agriculture sector is required more financial support in research, education, extension, and laboratories to test soil, and water. Extensive public spending in agricultural R&D would stimulate for agricultural scientist and young researchers to do more research in this area (Kumar et al., 2015b; Märza et al., 2015). Consequently, more R&D spending in agriculture would create innovative varieties of seeds and cultivation techniques (Kumar et al., 2016a). Agriculture Extension Offices, District Rural Development Agencies and local Non-governmental Organizations are mandatory to convey climate change related information to farmers on time. It would be beneficial for farmers to take precautionary action in cultivation (Kumar et al., 2016a). Short-term training to farmers would increase their perception towards climate change (Khajuria and Ravindranath, 2012; McKune et al., 2015; Kumar et al., 2016a,b). Appropriate infrastructure facilities would avoid the communication gap of rural farmers with cities market. Researchers, environmentalists and agricultural scientists are unable to give practical adaptation techniques to cope with climate change in agriculture due to unavailability of farm level information. Therefore, appropriate ground level information is required to facilitate research at farming households to identify a conclusive decision (Khajuria and Ravindranath, 2012; Kumar et al., 2015b).

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## 4

# Constraints in use of ICT among women farmers in farming practices with special reference to E-commerce in Agriculture

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## Abstract

Nowadays, ICT performs a leading role in any kind of business for marketing. While radio, television and print media were primarily used to perform these tasks earlier, with the advent of the new ICTs, these have now been considered as traditional ICTs. The new ICTs are commonly referred to evolving applications that rely on the Internet, telecommunication networks, mobile phones, personal computers and databases. These new ICTs have the potential of getting vast amounts of information to rural population in a more timely, comprehensive, cost effective and interactive manner. The study mainly focused on how the rural women farmers use ICT for their farming practices and agribusiness. Based on the findings, researcher concluded from the study, the women farmers perceived from their experience, the infrastructure is a main constraint to use the ICT for e-commerce in agricultural business. Some important implications for future research are also derived from the study.

**Key Words:** ICT, Constraint, E-Commerce.

## Introduction

ICTs generally refer to an expanding assembly of technologies that are used to handle information and aid communication. These include hardware, software, media for collection, storage, processing, transmission and presentation of information in any format (i.e., voice, data, text and image), computers, the Internet, CD-ROMs, email, telephone, radio, television, video, digital cameras etc. While radio, television and print media were primarily used to perform these tasks earlier, with

the advent of the new ICTs, these have now been considered as traditional ICTs. However, many of these traditional ICTs are effective than web-based solution, as they can resolve issues such as language, literacy or access to the Internet(UNDAW, 2002). Online services for information, education and training, monitoring and consultation, diagnosis and monitoring, E-Commerce for direct linkages between local producers, traders, retailers and suppliers. The facilitation of interaction among researchers, extension workers and farmers, Question and answers services where experts respond to queries, ICT services to block and district level up to date information supplied to farmers as early as possible about subjectssuch as packages of practices, market information, weather forecasting, input supplies and credit availability. Creation of databases with details of resources of local villages and villagers, sitespecific information systems, expert systems, provision of early warning systems about diseases/pest problems, information regarding rural development programmes and crop insurances, postharvest technology. Improved marketing of milk and milk products; servicesproviding information to farmers regarding business and management; increased efficiency and productivity of cooperative societies through the computer communication network and the latestdatabase technology.

The Agricultural Informatics and Communication Network (AGRISNET), constituted by the Department of Agriculture, provide improved services to farmers through information technology and seek to establish Indian agricultural online. Vari-

ous states including Tamilnadu have implemented AGRISNET, in collaboration with various agencies with customizations to suit local conditions.

#### **Review of Literature**

In the article, author has argued that Agricultural Information dissemination through IT is cost effective, time saving and speed of communication is very high, classified information and information storage capacity is enormous. Thus Extensions through IT is getting popular now a days. Few experiences are encouraging and open a great space for IT applications in agricultural extension(Chandra Shekara.P, 2001). Another research(Goldman Sachs, 2000) he concluded that despite significant growth in use of the internet by farmers,it is still far from universal and likely to stay so for considerable time. The reasons for non-adoption according to some research have to do with utility, relevance and affordability of the product; though technical limitations (Speed of rural telecommunications links) still have an influence. Goldman Sachs also argues that the potential for B2B e-Commerce is greater in industries. The Increasing adoption of information Technology leads of course to direct production gains and at the same time to reductions in operating costs.Rural women in Africa are generally not highly educated and there is an obvious gap in their understanding of business models and information technologyand its potential benefits to the community. This is clearly demonstrated in their inability toutilise the telecentre effectively. Women with access to ICT services increase their ability to generate income and are enabled to help empower other rural women(Richardson, 2000).

#### **Purpose of the Study**

To know how women farmers have to constraints in use of ICT practices in taking up cultivation.

#### **Objective of the Study**

To know whether any relationship between constraintsin use of ICT practices of e-commerce and experience.

#### **Hypothesis of the Study**

H1: There is no significant difference in the constraints of e-commerce factors based on experience of women farmers.

H2: There is no significant difference between constraints of e-commerce factors influence to constraints of e-commerce.

#### **Period of the Study**

This study covers a period of three months from March to May 2016.

#### **Methodology**

##### **Sample Frame**

The sample chosen for the study covers the farmers of different village of Perambalur District. Totally 300 farmers are selected on convenient sampling method from the randomly selected 30 villages in Perambalur District. 10 farmers are selected in each village.

#### **Data Collection Method**

Primary data collected from respondents by administering a structured questionnaire dealing with various aspects of workplace sequences. This study was carried out through a survey method using questionnaires as the main instrument.

#### **Statistical Tools**

Primary data were collected, tabulated. A pilot study was carried out to revise the questionnaires and for item analysis. The validity and reliability of the questionnaires were measured. The internal consistencies of scale were assessed through computing Cronbach's Alpha. Correlation was used in this study.

#### **Limitations of the Study**

1)Time constrain is a major limitations to the study and forced to restrict the respondents with in a stipulated time.

2)The study concentrated only on using ICT in e-commerce.

3)The information provided by the respondents is purely based on their perception only.

#### **Statement of Problem**

Agricultural marketing reform was considered an essential step to improve e-agro farm and e-agricultural marketing in India. A major setback to agriculture industry is its failure to plan production according to market requirements. In fact, it is this difference between man and women in using ICT and other industries and agriculture

which puts it in a disadvantages position. Market oriented production will surely benefit the farmers in India. It is to determine the role of e-commerce, combined with the concept of communities of practice can play to improve productivity in farms and knowledge of the women farmers.

#### Findings

Table - 1 Distribution of Level of Experience and Descriptive Statistics

	Frequency	Percent	Mean	S.D
Less than 5 yrs	45	15.0	3.48	1.568
5-10 yrs	62	20.7		
11-15 yrs	29	9.7		
16-20 yrs	31	10.3		
Above 20 yrs	133	44.3		
Total	300	100.0		

Source: Primary Data

H1: There is no significant difference in the constraints of e-commerce factors based on experience of farmers.

As shown in the table no.2, there is high degree of correlation between constraints of e-commerce factor namely cost of implementation and infrastructure with experience. Based on correlation value, since P value less than 0.01, null hypotheses rejected at 1% level. Constraints of e-commerce factor namely obstacles, benefit and lack of trust were not correlated with experience. There is a significant difference between constraints of e-commerce factor namely cost of implementation and infrastructure with experience of farming practices.

	Infrastructure	Cost of Implementation	Obstacles	Benefits	Lack of Trust	Years of Experience
Infrastructure	1					
Cost of Implementation	.337**	1				
	.000					
Obstacles	.242**	.237**	1			
	.000	.000				
Benefits	.236**	.150**	.278**	1		
	.000	.009	.000			
Lack of Trust	.240**	.069	.231**	.334**	1	
	.000	.236	.000	.000		
Years of Experience	.165**	.225**	.042	.045	-.001	1
	.004	.000	.469	.441	.987	

Table No: 2 Correlation Matrix

Source: Primary data\* Significant at 5% level \*\* Significant at 1% level

H2: There is no significant difference between constraints of e-commerce factors influence to constraints of e-commerce.

Table No: 3 Correlation Matrix

	Infrastructure	Cost of Implementation	Obstacles	Benefits	Lack of Trust	Constrains
Infrastructure	1					
Cost of Implementation	.337** .000	1				
Obstacles	.242** .000	.237** .000	1			
Benefits	.236** .000	.150** .009	.278** .000	1		
Lack of Trust	.240** .000	.069 .236	.231** .000	.334** .000	1	
Constrains	.640** .000	.611** .000	.619** .000	.639** .000	.603** .000	1

Source: Primary data \*\* Significant at 1% level

As shown in the above table no.3, reveals that the constraints factors associated with constraints of e-commerce practices using correlation analysis. P - Values are significant at 1% level. Based on the P-value in the above table, the infrastructure and benefits of E-Commerce is highly influencing in constraints of e-commerce Practices.

#### Conclusion

In the present study, based on the above findings, there is a significant relationship between constraints of e-commerce factors based on experience of farmers. From the correlation matrix, high degree of correlation between constraints of e-commerce factor namely cost of implementation and infrastructure with experience. Based on the findings, factors namely infrastructure and benefits of E-Commerce is highly influencing in constraints of e-commerce Practices. The researcher concluded from the study, the women farmers perceived from their experience, the infrastructure is a main constrain to using the ICT for e-commerce in agricultural business.

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# 5

## Linkage between Demographic Factors and Employee Job Satisfaction- A Critical Evaluation of Selected Organized Retails at Bengaluru City

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### Abstract

Retail industry is one of the pillars of Indian economy with its huge opportunities. Retail industry is largest in India, with an employment of around 8% and contributing to over 10% of the country's GDP. The Indian retail industry can be divided into two parts i.e. organized and unorganized sectors. Organized sector retailing refers to trading activities undertaken by licensed retailers i.e. those who are registered for sales tax, income tax etc. These include the corporate-backed hypermarkets and retail chains, and also the privately owned large retail businesses. Unorganized retailing, on the other hand, refers to the traditional formats of low-cost retailing, for example, the local kirana shops, owner manned general stores, paan/beedi shops, convenience stores, hand cart and pavement vendors etc. In the recent past the organized retail sector in India is experiencing its transformation. Customers are preferred to shop at organized retail shops due to increased disposable income, changing life styles and quality of services offered by the retailers. In this view the retailers are concentrating on having better HR policies to satisfy their employees thereby satisfying the customers too. But satisfaction of the employees is very difficult as the satisfaction is not only depended on the organizational facilities but demographic profile of the employees as well. Therefore the present study is an attempt to identify factors influencing employee satisfaction and the linkage between the demographic factors and employee satisfaction which will boost the development in the sector.

**Key Words:** Organized Retail Industry, Employee Job Satisfaction, HR Strategies

### Introduction

The retail sector has played a phenomenal role in India with tremendous contribution to the Indian economy. Retailing sector has been observing tremendous changes with the entry of organized retail companies. The organized retailing in India is undergoing a metamorphosis and is expected to scale up to meet international standards( ). At the same time the industry is experiencing cut through competition from the global retailers consequently they have realized the need for efficient manpower. In this backdrop satisfaction of the employees has become their prime concern. They have implemented strategies and provided their employees a good financial and non financial benefits where as the employees can be satisfied by these facilities. However Human beings are considered as the dynamic elements of management. The success of an organization depends hugely on the efforts of the human resources. Human resource is now recognized and utilized as the most valuable of all organizational assets. The resources of men, money, materials and machinery are collected, co-ordinate and utilized through people. But the difficult task in front of HR managers is to satisfy the employees, because the employee satisfaction is considered weighty when it comes to define organizational success. Employee's satisfaction is central concern particularly in the service industry. Need to enhance employee satisfaction is critical because it is a key to business success of any organization. At the same time apart from the efforts made by the

organization to satisfy its employees, other factors will also contribute to the satisfaction.

#### Review Literature

Deepika Jhamb, Ravi Kiran (2011) have focused on identifying the growth and growth potentials of organized retail industry in India. The Indian retail sector is witnessing tremendous growth with the changing demographics and an increase in the quality of life of urban people. Retail Sector is the most booming sector in the Indian economy. With a growing economy, improving income dynamics, rising awareness, and a youth-heavy customer base, India is well on its way to become one of the most prospective markets for the domestic and global retailers. The main objective of the study was to strategically analyze the Indian retail Industry. The present paper identify the drivers which affect the growth of the Indian retail market, looks at the major factors affecting the retail business and to carry out the SWOT analysis of organized retail in India. The results of the study depict that infrastructure, economic growth and changing demographics of consumers are the major drivers of organized retail in India. The location of the retail store, management style and adequate salaries to personnel enhance the effectiveness of retail business and are important factors for retailers.

Lise M. Saari and Timothy A. Judge (2004), opines that "Happy employees are productive employees", and "Happy employees are not productive employees". Because the employees satisfaction is depends on their attitude. Therefore the author suggested some of the strategies to the HR practitioner for their knowledge gap. The study recommends that the practitioners have to concentrate on the work situation as it is the cause of employee attitude. The study also entails that the culture and key personality traits, core self-evaluation are directly related with the employee job satisfaction. The study concluded that the field of industrial/ organizational psychology has a long, rich, and at times, controversial history related to the study and understanding of employee attitudes and job satisfaction.

Kurt Matzler, Birgit Renzl., (2007) evidenced in their article that the employee satisfaction is an innermost concern in service industry. It is a multi-

factorial construct. Employee satisfaction contains basic factors, excitement factors and performance factors. Basic factors are the minimum requirements that cause dissatisfaction. Excitement factors increase customer satisfaction and performance factors result in satisfaction only when performance is high.

Rachel W.Y. Yee, Andy C.L. Yeung, T.C. Edwin Cheng., (2008) Employee satisfaction is closely related to service quality and customer satisfaction which is then related to firm profitability. Service quality has a positive persuade on customer satisfaction. Besides this, firm profitability has a reasonable non-recursive effect on employee satisfaction. Employee satisfaction plays a considerable role in enhancing the firm profitability and improving operational performance of organizations and quality of goods and services. There is no doubt in it that employee satisfaction is critical to attain quality and profitability especially in service industry. Employee satisfaction impacts quality at industry through satisfaction-quality-profit cycle. In service industry, to achieve quality and profitability at organization, employee satisfaction is fundamental and without it, service industry cannot think of being successful.

#### Research Design

##### Research Gap

From the above literature review it is clear that many researchers have undertaken studies on employee job satisfaction in many organizations, they have concentrated on the different issues and influence of employee satisfaction on the organization performance. But in the field of organized retailing the employee job satisfaction is not studied clearly and the influence of the demographic factors on the employee job satisfaction is not addressed as well. Therefore the present study is an attempt to fill this gap.

##### Objectives of the Study

1. To study the factors determining employee job satisfaction at organized retail organizations at Bengaluru
2. To critically examine the influence of demographic factors on the factors influencing employee job satisfaction

### Scope of the Study

The scope of the present study has covered the employee of selected organized retail organizations in Bengaluru city like shopperstop, Reliance groups, Lifestyle, Future groups, More etc..

### Methods of Data Collection

In order to reach above stated objectives the primary data is collected through Questionnaire and observation methods. Secondary data is collected through published sources like Journals, Books and e-sources.

### Sampling Techniques adopted

For this study simple random sampling was used and respondent groups had the employees at both the levels of managerial and employee.

### Sample Size

The sample size of the study is limited to 300 employees who are working at various organized retail organizations.

### Statistical tool used for analysis:

In order to reduce the factors selected for the study factor analysis is used, before that to see the reliability of the data Cronbach's Alpha test has been used. In order to prove the set hypothesis for the study chi-square test has been used. And the test is done through the SPSS software

### Hypothesis tested

H10: There is no significant relationship between the demographic factors and employee job satisfaction under identified factor-1

H20: There is no significant relationship between the demographic factors and employee job satisfaction under identified factor-2

H30: There is no significant relationship between the demographic factors and employee job satisfaction under identified factor-3

### Scope for Further Research

Respondents considered for the present study is limited to 300 employees and also the study is only covered the geographical area of Bengaluru city. Further study can be done for various metro and Cosmo cities in India by applying various models available.

### Analysis and Discussions

In order to analyze the primary data factor analysis and to test the hypothesis set for the study chi-square test has been used.

### Factor Analysis:

In order to study the employee job satisfaction at the study area various factors has been used. Out of those factors to find out major factors that contribute towards the employee's satisfaction at selected retail organizations data reduction technique is used. The factor analysis is a statistical technique which is used to reduce the large number of attributes in to similar groups based on the responses received from the respondents. To check out the data reliability for factor analysis cronback's Alpha test has been used as shown below.

Reliability Statistics	
Cronbach's Alpha .826	N of Items 17

Table			
Rotated Component Matrixa			
	Component		
	1	2	3
There is a Flexibility in Working Hours	.017	-.114	-.086
Treated Fairly	.104	.827	.048
Supportive Manager	.037	.715	-.021
Freedom for Decision Making	.006	.912	-.032
Job Recognition	.893	.116	-.009
Team work atmosphere	.024	.136	.233

Relationship with the co-worker	.149	-.112	.660
Relationship with the higher authority	-.047	-.133	.729
Benefits and responsibilities are communicated with the employees	-.038	-.077	-.082
Satisfactory Salary	.769	-.004	.126
Good career Prospects	.692	.039	-.146
Appreciation of creativity and innovative ideas	.604	-.097	-.019
Satisfactory Welfare facilities	.893	.116	-.009
Involvement in management decisions	.784	-.032	.151
Training opportunities	.853	.178	.058
Opportunity to identify individual SWOT	-.114	.009	.681
Match between qualification and job responsibilities assigned to me	-.014	-.130	-.367
Extraction Method: Principal Component Analysis.			
Rotation Method: Varimax with Kaiser Normalization.			
a. Rotation converged in 4 iterations.			

Source: SPSS Output

#### Interpretation

From the above table it is clear that attributes under component 1 are Job recognition, good career prospects, satisfactory welfare facilities, and training opportunities which have a high factor loading of 0.963, 0.756, 0.963, 0.972 this shows that these attributes are much influencing the employee satisfaction in selected segments of organized retail organizations, therefore it is termed as Benefits and Career Growth.

The attributes coming under Component 2 are Fair Treatment, Supportive manager and freedom for decision making, which have a high loading of 0.819, 0.732 and 0.926, this shows that these attributed are next influencing factors to the employee job satisfaction at organized retail organizations, which is named as Empowerment and Working Environment.

The attributes coming under Component 3 are Relationship with co-workers, Relationship with the higher authority, Satisfactory Salary, involvement in management decision, which have a high loading of 0.660, 0.729 and 0.681, this shows that these attributes are next influencing factors to the employee job satisfaction at organized retail organizations, which is named as Working Relationships.

Remaining factors like team work atmosphere, communication of benefits and responsibilities, match between qualification and job responsibilities, and flexibility in working hours are not much influencing factors to the employee job satisfaction.

Further to study the influence of demographic factors on the satisfaction level of the employees regarding the identified factors the following hypothesis has been checked out by using Chi-square test.

**Hypothesis Testing:**

H10: There is no significant relationship between the demographic factors and employee job satisfaction under identified factor-1

Chi square test for Factor-1(Benefits and Career Growth) and Demographic Factors							
Test Statistic							
	Job Recognition	Satisfactory Salary	Good career Prospects	Appreciation of creativity & innovative ideas	Satisfactory Welfare facilities	Involvement in management decisions	Training opportunities
Chi-Square obtained value (Gender)	0.29	0.199	1.13	1.139	0.169	0.312	0.075
Df	4	4	4	4	4	4	4
Critical value	9.488	9.488	9.488	9.488	9.488	9.488	9.48
Chi-Square obtained value (Age)	1.823	0.837	1.495	0.695	1.828	0.947	1.025
Df	2	2	2	2	2	2	2
Critical value							
Chi-Square obtained value (Education Qualification)	2.020	0.036	3.387	1.535	2.020	0.576	0.500
Df	1	1	1	1	1	1	1
Critical value							
Chi-Square obtained value (Marital Status)	0.111	0.704	0.591	0.032	0.111	0.299	1.043
Df	1	1	1	1	1	1	1
Critical value							
Chi-Square obtained value (Social Background)	0.181	0.001	0.128	0.388	0.189	0.063	0.000
Df	1	1	1	1	1	1	1
Critical value							
Chi-Square obtained value (Length Of the Service)	1.525	0.07	0.847	0.098	1.525	0.019	0.671
df	16	16	16	16	16	16	16
Critical value	26.296	26.296	26.296	26.296	26.296	26.296	26.296

Inference: From the above test it can be clear that in all the cases calculated chi-square value is less than the critical value. Hence the null hypothesis is rejected and it is proved that the demographic factors like Gender, Age, Education qualification, Marital status, social background and length of the service is influencing the satisfaction of the employees for the components of Factor-1.

H2O: There is no significant relationship between the demographic factors and employee job satisfaction under identified factor-2

Chi Square test for Factor-2 (Empowerment and Working Environment) and Demographic Factors			
Test Statistics			
	Treated Fairly	Supportive Manager	Freedom For Decision Making
Chi-Square (Gender)	2.91	0.594	1.434
Df	2	2	2
Critical Value			
Chi-Square (Age)	0.002	0.002	2.059
Df	4	4	4
Critical Value			
Chi-Square (Education Qualification)	4.759	1.692	2.899
Df	1	1	1
Critical Value			
Chi-Square (Marital Status)	3.411	3.230	5.998
Df	1	1	1
Critical Value			
Chi-Square (Social Background)	2.424	0.500	1.108
Df	1	1	1
Critical Value			
Chi-Square (Length of the Service)	0.814	1.105	0.529
Df	16	16	16
Critical Value	26.296	26.296	26.296

Inference: From the above test it can be clear that in all the cases calculated chi-square value is less than the critical value. Hence the null hypothesis is rejected and it is proved that the demographic factors like Gender, Age, Education qualifi-

cation, Marital status, social background and length of the service is influencing the satisfaction of the employees for the components of Factor-2.

H30: There is no significant relationship between the demographic factors and employee job satisfaction under identified factor-3

Chi Square test for Factor-3 (Working Relationships) and Demographic Factors			
Test Statistics			
	Relationship with the Co-Worker	Relationship with the Higher authority	Opportunity to identify individual SWOT
Chi-Square (Gender)	1.222	0.661	0.265
Df	4	4	4
Critical Value	9.488	9.488	9.488
Chi-Square(Age)	4.506	1.76	0.26
Df	2	2	2
Critical Value			
Chi-Square(Education Qualification)	2.588	0.181	0.059
Df	1	1	1
Critical Value			
Chi-Square(Marital Status)	0.107	0.035	1.085
Df	1	1	1
Critical Value			
Chi-Square(Social Background)	0.331	1.754	0.012
Df	1	1	1
Critical Value			
Chi-Square(Length of the Service)	0.29	0.08	1.841
Df	16	16	16
Critical Value	26.296	26.296	26.296

#### Inference

From the above test it can be clear that in all the cases calculated chi-square value is less than the critical value. Hence the null hypothesis is rejected and it is proved that the demographic factors like Gender, Age, Education qualification, Marital status, social background and length of the service is influencing the satisfaction of the employees for the components of Factor-3.

#### Discussions

From the above discussions it is clear that all three null hypotheses are rejected. The reason for this is the employees working at the organized retail organizations are not much qualified for all the cadres. For managerial level only the retailers appoint the degree holders and PG holders, whereas for other jobs they prefer SSLC and PUC holders. Moreover the organized retails are providing job opportunities for urban and rural people as well. And the facilities provided by them are

much better than other industries like textiles, manufacturing, and garments. In order to compete with the global players in the field the retailers are also adopted good HR strategies that made the employee to satisfy with the benefits and also facilities. However the demographic factors are the major contributors to the employee job satisfaction, as the expectations of the people in the organization always depends on their gender, age, marital status and also other demographic factors. The present study has proved the same. In addition to that the satisfaction of the employees at the selected organized retail organizations is also studied.

#### Major Findings

For the study many variables are selected to check out the employee job satisfaction but in order to find out the variable which influence much factor reduction technique has been used. In the factor reduction technique many variables are not considered for further analysis as they got least factor loading, the reason for least factor loading is because of the negative response of the respondents for some of the variable selected for the study. The negative response says that they are not satisfied with some of the issues in the organization. Those issues can be discussed as Flexibility in working hours, team work atmosphere, communication of benefit and responsibilities and also match between qualification and job responsibility assigned.

#### Managerial Implications

- i. In order to solve the above identified problems it is suggested that the retailers can provide shift facilities to the employees where as they can reduce the waste of manpower and also go for proper utilization of it.
- ii. The retailers can also have training centers and facilitate training programmes to the employees to develop their interpersonal skills and develop team work atmosphere.
- iii. Measures should be taken for the proper communication of the responsibilities assigned to them and also benefits provided to the employees, so that the employees can full fill their responsibilities properly and make use of the benefits provided at the organization.

iv. The employees can be appointed based on the qualification and also experience can be considered while promoting them to the higher level jobs so that the problem of match between the qualification and responsibilities assigned can be solved.

#### Conclusion

Retail industry is one of the pillars of Indian economy with its huge opportunities with an employment of around 8% and contributing to over 10% of the country's GDP. Especially organized retails in the recent years experiencing tremendous growth with the entry of global players and strengthened domestic players. Now a days the customers are also preferred to shop at organized retail shops not only for the quality and verity in addition to that the service provided. Therefore in order to satisfy the potential customers the retailers need to adopt HR strategies which lead to both employee satisfaction and customer satisfaction. Because, the satisfied employees can only keep their customers happy and satisfied. However the employee satisfaction also depends on the demographic factors. The organization needs to imbibe the policies and practices which lead to employee job satisfaction.

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# 6

## Sources of Entrepreneurial Finance in Dodoma Municipal, Tanzania

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### Abstract

Small businesses irrefutably remain critical to the development of any country's economy as they are an exceptional, source of workgroup, help in expansion of local know-how, and develop originalfinanciers. A crucial component in the growth of the SME sector is access to finance, particularly to bank financing, given the relative importance of the banking sector in serving this segment. Since failure of people of Tanzania to get seed capital severely affects the community livelihood and that SMEs have been proved to alleviate poverty. The main purpose of the study is to evaluate the entrepreneurial finance challenges and the extent of financing of SMEs within the Dodoma Municipal, taking cognizance of the role and contributions of Financial Institutions in Tanzania. The study purposively sampled 100 respondents out of which 80 respondents were drawn from 80 SMEs and 20 respondents from lecturers belonging to [5] high learning institutions and [15] funding institutions respectively. The study further revealed that high interest rates; lack of finances and unfavorable tax charges as major constraints to the growth of SMEs. The major challenge could be interpreted to mean lack of entrepreneurial finance.

**Key Words:** SMEs capital, Entrepreneurial Finance, SMEs projects.

### Introduction

The financial structure is the vessel that transmits this life-blood over the economic system. Faulty vessels prevent the life-blood from reaching essential parts of the economic system"

(Sowah N.K., 2003). Small industriesconclusively remain dangerous to the growth of any nation's budget as they are an outstanding, source of employment generation, help in development of local technology, and develop indigenous entrepreneurs (Erdem and Erdem, 2011; Alaye-Ogan, 2012). The importance of small businesses to the citizens' standard of living and the nation's general growth cannot be overemphasized.

Start-up (Seed Capital) SMEs are a key driver of sustainable economic development of the country. Start-ups for the purpose of this research are defined as new businesses that have been in operation for a period of less than 3.5 years (Maas & Herrington, 2006). In addition, Maas and Herrington (2006) suggest that if the government wants to sustain economic growth that will create wealth for all, efforts should be made to increase new business start-ups.

According to the Umsobomvu Youth Fund (2008) only about two out of every ten applications for credit by start-up SMEs are approved in Africa. Wood and Herrington (2005) also point out that 75% of credit applications by start-up SMEs to banks in Africa are rejected. In developed countries, the situation is markedly different. According to Statistics Canada (2004) in Riding and Orser (2007), there is approximately 82% approval rate for credit applications by start-up SMEs in Canada. In 2000, 23% of start-up SMEs made requests for debt financing and 82% were approved. Of the loans approved, 75%were not covered by a federal loan guarantee. In England, 71% of applications for credit by start-up SMEs from financial institutions between 2004 and 2007 were

approved. Twenty six percent (26%) were wholly or partially rejected. A ninety three percent (93%) success rate was achieved in asset based lending and factoring, 75% for overdrafts, a 70% success rate for credit cards and 88% for leasing and hire purchase. This suggests a weak access to finance by start-up(seed capital) SMEs in Africa which must be addressed if their high failure rate is to be reduced. In developing countries, this task is executed by Microfinance Institutions (MFIs), which provide small loans, to financially excluded people who cannot offer any collateral (Kirumba, 2000).

Tanzania SME National Policy also indicates that SMEs all over the world are known to play a major role in social economy development. This is apparently the case of Tanzania, where SMEs contribute significantly to employment creation, income generation and stimulation of growth in both urban and rural areas. It is estimated that about one third of the GDP originates from the SME sector.

Brush and Hart, (2001), sadly noted that there hasn't been any bank or funding agencies with deliberate policy model of encouraging and promoting entrepreneurial finance and resource acquisition. In the same vein, Chigunta, (2001) submitted that if such institutions, are there, their interventions are yet to be registered in the society most probably because budding entrepreneurs have not been able to cope up and stomach their stringent requirements for would be beneficiaries of such funding agencies and financial institutions.

Since failure of people of Tanzania to get seed capital severely affects the community livelihood and that SMEs have been proved to alleviate poverty, therefore there is a growing need of assessing factors affecting the acquisition of seed capital among entrepreneurs in Tanzania.

#### Literature Review

##### An overview of Small Business Financing Theory

In a seminal paper, Ang (1992) demonstrated the importance of acquiring start-up capital for small businesses. While finance theory generally posits

that all firms have equal access to financial markets and that all share similar competitive positions (van Auken and Neeley, 1996), small businesses often face severe difficulties compared to large businesses. Numerous supply-side factors - limited information, market imperfections, and agency relationships to name only a few - affect small firms particularly severely and make traditional finance theory inapplicable to their situation (Ang, 1992; McMahon et al., 1993; Petty and Bygrave, 1993). Indeed, sources of finance available to small businesses differ strongly from those available to large companies, and their widespread lack of access to the loan market violates the assumptions of perfect capital markets (Ang, 1992, van Auken and Neeley, 1996).

#### Pecking Order Theory

Ang, (1992) rightly observed that financing decisions for new ventures may also be more complex because they are closely linked to the personal wealth or contacts of the owner/manager. Accordingly, agency problems may be more intense as shareholders and partners are often made up of family and friends. Consequently, the pecking order theory of firm financing is one method firms might use to address these agency problems. Both Myers, (1984) and Myers and Majluf, (1984) submitted that this theory holds that new ventures do not intend for a target debt ratio. As an alternative, new ventures opt for funding sources that minimize the cost of capital. In the case of the startup businesses or new venture, personal sources are used first, external debt next, followed by outside equity.

In survey of 136 small firms in Tanzania, Satta (2003) found that 63% of them consider difficulties in accessing finance from financial institutions as the major constraint to their development. Ayyagari et al., (2006) using sample of 80 countries including Tanzania they found that access to finance is an important constraint to firm growth. They suggest for further investigation of country and firm level determinant of financing obstacles for future work. Maliyamkono (2006) noted that total credit during 2006 stood at 36% of commercial banks deposits and was concentrated on large firms. Likewise, Olomi (2009) noted that,

studies consistently show that over 70% of SMEs in Tanzania perceive finance to be the most serious impediment to the establishment and development, although banks in Tanzania generally do not have liquidity problems.

Cogburn and Adeya, (2000) posits that the information and communication infrastructure in most African nations is feeble yet access to information infrastructure is considered an indispensable condition for widespread socio-economic development in this age of globalization and information economy. According to Eifert and Ramachandran, (2004) the result of poor communication networks in most African countries is the low level of Internet usage. On the other hand, Africa has low telephone penetration; insufficient broadcasting facilities; computing infrastructure and other consumer electronics.

Ramachandran, (2004) submitted power supply as a leading challenge in most African nations. In response to power cuts and shortages, few entrepreneurs who can manage to pay for generators to power their business operations (Akwani, 2007). However, the use of generators increases production costs and making their products less competitive. Additionally, poor transportation facilities and bad roads result in higher cost of moving goods from one area of the country to the other.

#### Research Methodology

This research study is aiming to provide vision with regard seed capital challenges for small and medium enterprises (SMEs) in Dodoma Municipal.

A research design focuses on a conceptualized, practical structure within which a study is conducted and constitutes a blue print for measuring variables, collecting and analyzing data.

The method of convenience sampling was employed in arriving at the 80 SMEs, which the researchers believe possesses the experience relevant for this study and who have sufficient time and were willing to participate (Morse, 1998).

The researcher has used personal in-depth interviews to optimize data collections from the SME

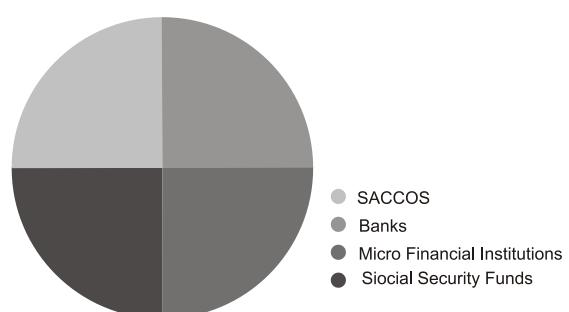
experts and funding institutions to understand their opinions and experiences in relation to seed capital challenges for small and medium enterprises (SMEs).

The study employed both probabilistic and non-probabilistic sampling procedures. The data and sample size of this research has been determined based on Sekaran (2010, p. 295) sample determination table. Data are analyzed and summarized by using both SPSS and excel and the appropriate recommendation and conclusion were drawn. Data are analyzed using both qualitative and quantitative techniques. Secondary data are analyzed using documents reviews and available literature.

#### Findings and Discussion

In the face of the increasing recognition of SMEs as a source of job creation, empowerment and economic vitality in a rapidly globalizing world, it is imperative to undertake an investigation on available sources of entrepreneurial finance and their requirements, thus the prerequisites for funding granted to SMEs. This has been motivated by the fact that the potential benefits of SMEs as a viable career option so as to later discover obstacles or rather challenges they may face in their [SMEs] entrepreneurial finance and resource acquisition journey. Figure 1 below highlights the potential sources of funding for SMEs

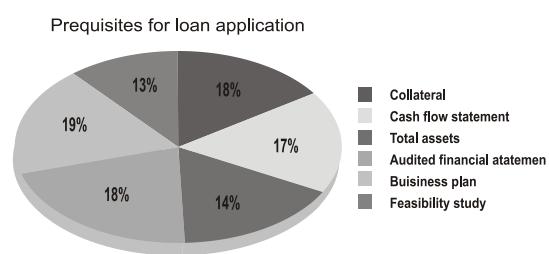
Figure 1: Potential Sources of Funding for SMEs in Dodoma



Source: Author Field Findings (2016)

The figure above shows that 25% SMEs receive funding from banks; 25% receives their funding from micro financial institutions; 25% get their funding from social security funds; while 25% receive their funding from SACCOS. This is in agreement with Brush, and Hart, (2001) rightly observed that businesses often need more capital than owners are able to provide. Consequently, they source financing from external investors which include: angel investment, venture capital. In addition, though with fewer incidences, they also source from crowd funding, hedge funds and alternative asset management (Alemany, 2007). According to Mason, (2009) sources of funding include but not limited to: Banks; Government; NGOs; Microfinance institutions; Donor Agencies; Business Angels; Family. However, these are usually described and categorized in technical terms namely the business angels and the venture capital. Alternatively, they can be categorized as external financing and business Angels respectively. Having have realized the sources of funding in Dodoma the next step was to discover the prerequisites for loan application.

Figure 2: Discovering prerequisites for loan application



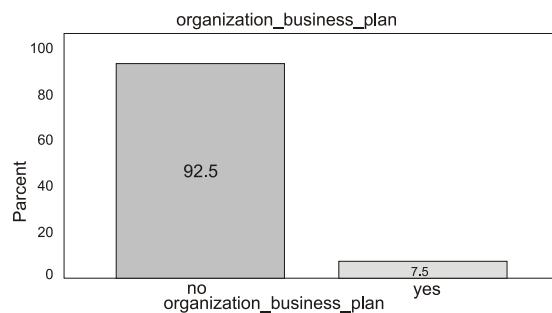
Source: Author Field Findings (2016)

The above pie chart highlights the views of SMEs regarding the Prerequisites for loan application to which respondents rated Business plan to be the top requirement [19%]; followed by Collateral [18%] which tied with Audited financial statement [18%] followed by Cash flow statement [17%]; followed by Total Assets [14%] and feasibility study [13%] which was rated the least. This implies that in as much as business plan; collateral security and audited financial statements

are top requirements, the rest of the prerequisites are also some of the extra requirements demanded by banks and other funding institutions for SMEs to produce when applying for loans. This is indicative of the fact that seed capital is hard to come by for many SMEs as they would not be able to meet bank requirements.

The next set of question was determined to find out if the SMEs under study had an existing business plan and the majority of respondents revealed that they don't have business plan as enshrined [on the graph] figure 3 below.

Figure 3: Exploring the number of SMEs who have business plans



Source: Author Field Findings (2016)

The figure above highlights that the majority of SMEs don't have the business plan as suggested by 92.5% of the respondents compared to only 7.5% who said they have business plans. The conclusion is that many SMEs don't have business plans. The implication is that they do the business without the book and have no road map on which their business has to follow. In other words, they just operate anyhow. It also implies and justify why financial acquisition for these SMEs could be difficult because the banks and other financial institutions would set that (business plan) as a requirement in sourcing funds from them.

#### Conclusion

The study further revealed that high interest rates; lack of finances and unfavorable tax charges as major constraints to the growth of SMEs. In a nutshell, the major challenge could be interpreted to mean lack of seed capital. In the event funding

institutions become flexible in their requirements for loan applications, respondents registered their willingness to increase the number of their employees; the number of branches and willingness to accept professional advice. In other ways, the only best way to help SMEs access seed capital lies in the hands of funding institutions as justified and suggested by the majority of SMEs who submitted that the key determinants for seed capital acquisition are: fair and low interest rates; philanthropy; in-excessive demand for collateral security; less cumbersome procedures and realistic repayment schedules. It is to this effect that the study conclusively posits with a heavy heart that most probably there hasn't been any bank or funding agencies with deliberate policy model of encouraging and promoting SMEs activity in Tanzania and Dodoma in particular. If such institutions, are there, they could be very few with less impact and their robust interventions are yet to be registered in the society most probably because SMEs have not been able to cope up and stomach their stringent requirements for would be beneficiaries of such funding agencies and financial institutions.

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# 7

## Case Study

### ICTs & Retail Industry Solutions - How IT companies are changing the global supply chain process. A case study of Landmark Group

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The Rules of Retail have changed. These New Rules bring new opportunities for the retail industry - opportunities that might themselves become game changers. More and more, innovative retailers are resorting to using brilliant strategies, advanced technologies, best practices, and operational excellence - grow revenue by delivering satisfying buying experiences wherever their customers are and whenever they want to buy. Today, many retailers are partnering with software companies to receive innovative business solutions, and comprehensive portfolio of offerings, which help the retailers use these rules to guide them and build deeper and stronger customer relationships, reduce cost and increase efficiency. ICTs help them achieve this through their integrated IT, BPO, and Infrastructure services and proprietary Retail Industry Solutions.

The rapid advancement in the Information Technology has accelerated the support of Customer Relationship Management (CRM) system. The proposition of this research is to find out the economic feasibility of e-CRM in selected retail outlets. Customer relationship management (CRM) system consists of the processes, a company uses to track and organize its contacts with its current and prospective customers. CRM software is used to support the processes viz. information about customers and customer interactions can be entered, stored and accessed by employees in different company departments.

Technology proves beneficial in creating and maintaining customer relationships. Analysis of data collected at the retail point of sales helps under-

stand preferences, buying habits, spending budgets, family needs of an individual customer. Relationships are maintained by utilizing IT for periodical e-mailing, SMS, greetings, promotional letters and personal calling. Retailing growth has demanded IT deployment to broaden its arena and overcome challenges namely Business Optimization, increasing SCM efficiency, innovating shopping experience and other manual limitations.

The Landmark Group is a leading retail and hospitality conglomerate in the Middle East and India. They operate over 1,500 outlets encompassing over 20 million square feet, spread across 19 countries. Starting with a single outlet in 1973, today the Dubai-headquartered Landmark Group sells a broad range of products including general merchandise, furniture, white goods, electronics, baby needs, fashion garments and more. Their core retail brands include Home Centre, Centrepoint, Babyshop, Splash, Shoe Mart and others.

Building efficient supply chains and logistics processes poses many strategic challenges to any global enterprise. Landmark Group has over 15 retail chains in over 1,500 locations across the Middle East and India - the challenge takes on new dimensions. Landmark Group understood that a challenge of this scope could only be met with a proven enterprise solution such as Oracle Retail and partnered with TCS to achieve supply chain excellence.

#### Business Challenge

Retail and CPG companies are facing a number of challenges due to increasing complexity

of supply chains caused mainly by offshoring of manufacturing. Increased lead times, demand variability and supply disruptions are forcing companies to pile inventories thus leading to opportunity losses and higher cash conversion cycles. Demand forecasting has assumed critical significance in managing supply chains efficiently. Having an agile supply chain network that seamlessly connects demand, supply and product remains the top priority for retailer and consumer companies.

Key to the success of a global enterprise is an optimized and efficient supply chain: knowing where your inventory is, its true cost and its best pricing, when it's been sold and when it's been shipped—and more. From the way goods are imported to the way sales are posted, Landmark Group's logistic and supply chain operations form a unique operational fingerprint—a set of business processes unlike any other.

Understanding the importance Landmark Group chose to address their enterprise challenges by implementing an Oracle Retail solution. They knew the solution had to be acceptable to all their different businesses, and accommodate all their different product lines. They also knew that the Oracle solution would have to be extended in certain areas to meet their specific operational model and retain the group's competitive advantage.

Landmark Group needed an IT services partner that understood not just how to implement the Oracle platform but how to extend it, a company that understood not just technology, but also the complexities of retail supply chain, logistics and financing. In this endeavour they associated with TCS. TCS's in-depth know-how of retail expertise, and experience in implementing Oracle Retail, made them the ideal choice. They specified, designed, developed and supported a solution centered on the base Oracle Retail product suite and a set of bolt-on custom modules to deliver the functionality the Landmark Group required.

The unique challenges Landmark Group faced included understanding how to:

- Improve supply chain efficiency by having the ability to dynamically change the routing and mode of transport for importing goods

- Realize uniform pricing across the Gulf Co-operation Council (GCC) countries for products to manage value added services at supplier or manufacturing site
- Enhance the customer delivery solution to have better supply chain tracking and improve customer satisfaction
- Enhance store replenishment and stock taking processes to minimize stock out situations at stores
- Eliminate manual entry in financials, across multiple sets of books for merchandising operations
- Implement flexible putaway logic to manage space constraints in the warehouse

#### ICT Solution

TCS addressed all of the Landmark Group's critical and complex requirements with a fully turnkey solution that is named as Genesis: based solidly around the Oracle Retail Suite 13.1, augmented and enhanced to conform exactly to their specific operations, and supported by TCS.

They implemented Oracle Retail 13.1 to take care of central buying, and supply chain operations for the UAE and Bahrain using a single instance of the Oracle suite to support 12 different business units including MFP, ORMS, ORPM, ORAlloc, OReIM, OReSA, ORWMS, ORSIM, OARI and ORIB.

They implemented the same solution across the remaining Gulf Cooperation Council countries. TCS extended the Oracle Retail 13.1 solution to fit Landmark's business needs by:

- Creating a Logistics bolt-on module to manage import, export and multi-leg routing of the supply chain process
- Developing and implementing a large custom module to support the trading business (i.e. Re - Export) and end to end Customer Order Delivery, spread across multiple systems
- Developing an initial pricing engine to factor cost, incidental expenses, and margin to derive uniform pricing across the GCC countries. This is shared with suppliers as a value added service before goods are dispatched

- Simplifying the store return process (very common with very high volumes during end-of-season sales) to better manage stock at warehouses
- Creating a complete bolt-on module to take care of delivery management for customers, primarily for furniture products
- Developing a flexible put away process to minimize space constraints in the warehouse
- Addressing and automating complex financial posting requirements pertaining to the multiple legal entity structure of the Landmark Group across multiple territories
- Developing the bin-based stock count process at stores to improve inventory accuracy and reduce pilferage
- Creating a custom replenishment engine to take care of store needs to minimize the stock out situation at stores
- Implementing Merchandise Financial Planning (MFP) for better Pre and In-season planning
- Assisting warehouse managers to implement physical layout changes and improve operation efficiency
- Integrating Genesis solution seamlessly with all satellite systems to ensure data consistency across the systems
- Providing business cutover, data migration, operational report and warranty support
- Conducting Train the Trainer workshops for approximately 120 users

## Results

The Landmark Group continues to derive benefits from the partnership, including:

- Increased return on inventory investment with higher supply chain dynamics, smoother end-to-end logistics flow, and more accurate costing
- Greater control over the business processes and a near real-time visibility of stock and sales across the enterprise

- Accurate, detailed inventory tracking that ensures proper planning, replenishment and increased customer satisfaction
- Accelerated receiving cycle, reducing the time required to move and sell items
- Improved customer satisfaction through end to end visibility into the customer order delivery cycle
- Enhanced inventory visibility across the group, allowing for a better replenishment algorithm for seasonal and core products
- Increased efficiency and accurate financial recording of all inter-company activities between territories

## Conclusion

In today's scenario, it's a very well-known fact to everyone that the customer is the king. This is also one of the reasons that the level of difficulty is increasing day by day to retain customers. With the advancement in IT sector, customers are becoming more and more informed about their purchases. Media is educating them and they scout around for best product, brand name, product quality, operation and service support. In all these customer support is very essential. Organizations aim at satisfying customer's needs and desires. Traditional Customer Relationship Management used to face problems like delay in attending the customer query and delay in extending the timely service support due to manual operations. This can be achieved only with the best practices of E-CRM, as it helps organization provide high quality, interactive multimedia customer support and aims to improve customer acquisition, retention and transactions.

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# 8

## Student's Paper

### A Study on the Growth in Apparel Retail Sector

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#### Introduction

An Apparel retail industry has grabbed special attraction in recent days. Top exporters who were manufacturing apparels for foreign countries have introduced their own brands in the market and are aggressively positioning themselves within segments of the domestic market. The increasing importance of branded clothes in the domestic market combined with the import competition is blurring the boundaries between exports and domestic production in countries with large home markets, such as India.

With the changing lifestyles of the Indians and the organized retail business is playing a key role in structuring the Indian domestic market, reinforced in particular by rising incomes and growing purchasing power among consumers in rapidly growing sectors of the economy such as information technology and business process outsourcing.

Garment retail sector in India is making a way for new formats such as departmental stores, hypermarkets, supermarkets and specialty stores. The branded apparel market represents the largest source of growth. The men's branded apparel market is growing at a rate of 21.8% and branded women's apparel segments represents 35% of the total branded apparel market and is growing at an incredible 23% annually.

Domestic retailers are becoming more firmly entrenched, increasing their scale of operations and stabilizing their Freight and technology initiatives. Foreign players have been selling their branded apparel in India for number of years. But, now, just like their Indian counterparts, international apparel brands are making up their chain of app-

arel outlets of their own, instead of just selling through departmental stores. Though local retailers generally enjoy higher margins, they won't be able to keep global retailers at bay for long because of international experience of their product, buying power of customer, IT systems and cash flow to tolerate lower profits. Presence of these brands will make the Indian Consumer become more aware of the international fashion and lifestyle trends leading to a move-up of the industry in the value chain. In this paper, the recent trend and prospect of apparel retail sector in India have been discussed.

#### The Global Retail Scenario

Retailing has been defined as the business activities involved in selling goods and services to consumers for their personal, family or household use. The 20th century witnessed a lot of change in the retail sector, especially in the developed countries. Modern trends such as department stores, Margin free stores, supermarkets, convenience stores, fast food outlets, speciality stores, warehouse retailers and hypermarkets have emerged. Retailing has become more organized and chain stores have been growing at the expense of independent shops.

The chains are utilizing sophisticated information technology and communication to manage their operations and have grown rapidly not only within their home countries like US, UK, France, Germany and Holland but to other developed countries. For example Walmart Stores, the US retailer, one of the largest firms in terms of sales. Modern retail formats have also spread beyond developed countries and are becoming more important in the developing countries.

Indian retail industry cannot hope to learn much by merely looking at the Western success stories of retail stores and their chain showrooms in retail. Their scales of operations are very huge, the profit margins that they earn are also much higher and they operate in multiple formats like discount stores, warehouses, supermarkets, departmental stores, hyper-markets, convenience stores and specialty stores. The economy and lifestyle of the Western culture is not in line with that of India and hence the retailing scene in India has not evolved in the same format as the Western nor can we learn valuable lessons from their style of operation.

#### Indian Apparel Retail Scenario

In its market research report, Indian Retail Sector - An Outlook RNCOS estimated that the Indian apparel retail industry generated revenue of \$2.0 billion in 2004 with a growth rate of 8.2% during 2000-14. As a result, Apparel retail industry in India is second largest in the world after China. The Indian apparel retail industry varies within even short distances, as the designs of the outfits are based on the regions.

According to this year's Global Retail Development Index India is positioned as the leading destination for retail investment. This followed from the saturation in western retail markets and we find big retailers like Wal-Mart and Tesco entering into Indian market. With the organized retail segment growing at the rate of 25-30 per cent per annum, revenues from the sector are expected to triple from the current US\$ 7.7 billion to US\$ 24 billion by 2020.

In fact, despite the FDI policy pertaining to retail being unclear, over 10 foreign niche segment retailers have recently set up or announced their intention to set up shop in India using the franchise route, with several others waiting in the wings.

International brands such as Benetton, Lacoste, Flying Machine, Ruggers, Levi Strauss, Crocodile, Dockers, Lee, Wrangler, Nike, Reebok, Adidas, Guess, Esprit, Mango, Hugo Boss, Mark & Spencers and Tommy Hilfiger have already built a retail market in the country, while market watchers point out that several more such as Versace, FCUK, Zara, Mother Care, Ikea, Fendi, NEXT, Debenhams, Trussardi, and DKNY have charted

out a strategy to enter the Indian market. Most of the brands entering the market are targeted at the premium end. According to estimates, the premium apparel segment in India is valued at about Rs 1,900 crore and growing at 20 per cent.

In addition to the patterns above, four additional factors which are transforming supplier capacities in ways that are blurring the boundaries between firms producing for the domestic market and those producing for exports are as follows:

1. Enhancement of local capabilities in the area of logistics i.e. warehousing and customized tracking systems.
2. Interesting emergence of design as a source of competitive advantage in Indian apparel industry.
3. Growing importance of local investment by Indian apparel firms as a way to counter the exclusion of India from all major regional trade agreements and the advantage of tariff free entry into major markets that many of India's competitors enjoy i.e. Mexico in the US markets, Turkey and Bangladesh in EU markets.
4. Increasing focus on domestic brands.
5. Increasing brand consciousness among people.
6. Government support towards local makers.

Renowned exporters in the country such as Reliance, Arvind, Raymond, Orient Craft etc. are developing their supply networks and distribution systems, seeking distinctive niches and generally staking out their terrain in the domestic market to consolidate their first mover advantage. Success story has emerged in the domestic apparel garment segments for the local brands and not limited to Pantaloons, Lifestyle and West Side only. No wonder a heavy weight like the Reliance group is planning to do a Wal-Mart in India.

Now there is an increasing demand of branded apparel segment in the domestic retail market for the same features that are valued in demanding export markets. These shifts in retail are fuelling the demand for good quality and trendy apparel, which in turn deepening the importance of aesthetics and design in the domestic market. It is worthwhile to mention that the rise of younger class of middle-class consumers, spawned by the booming BPO and IT sector, has led to burgeon-

ing demand for locally designed, ready to wear clothing in Indian metros. As many surveys have established, with good salaries, strong peer pressure and the growing availability of brands across product categories, spending in retail is being driven by the youth segment in large and mid-sized metros.

#### Development of Retail Concept

With the advent of the e-commerce, new retail concepts have also been developed. It is a necessary component for keeping stores fresh and relevant and for staying ahead of their competitors. Also making ease access of their customers. This is even more important today when consumers will have numerous option available. Now is the time for retailers to be developing new concepts or, at the very least, rethinking and reenergizing their current formats. An important and compelling reason for innovation is the overall compression of the retail life cycle. Where a concept once had 30 to 40 years to progress through the retail life cycle, the average life cycle is now greatly compressed. In the present scenario, ideas get into market faster, grow more explosively, and face obsolescence in a shorter period. The driving forces towards development of apparel retail in India are:

- Economic developments
- Changes in consumer needs, attitudes and behaviour
- Influence of fashion
- Changes in government policies
- Increased investment in retailing
- Rise in power of organized retail.

#### Economic Development

The development of the Indian economy is a necessary condition for the development of the Indian retail sector. The example of Thailand shows that the motivation to modernization of retail was provided by the economic boom in Thailand. Development increases the disposable income in the hands of consumers which leads to an increase in the proportion of spending on discretionary non-food items. Economic development also empowers new households as potential customers

for modern retail and leads to increased ownership of personal transportation among consumers, which in turn can increase their willingness to travel longer distances to shop in new format stores. The growth of the economy can also provide gainful employment to those who would otherwise enter retailing in areas like hawking, roadside vending and other similar low cost entries into the retail sector. Rapid economic development may also positively influence the views of international retailing companies about the business prospects and investment attractiveness in a country. A high degree of inflation in the economy is however, not conducive to modernization of the retail sector. In Brazil, the real progress in retail was noticed only after the stabilization of the economy and control of inflation. Development also has an influence on the regions and cities where modern formats are initially set up.

#### Changes in Consumer Needs, Attitudes and Behaviour

The growth of modern retail is linked to consumer needs, attitudes and behaviour. Marketing channels emerge because they receive motivation from both the supply side, and the demand side. On the demand side, the marketing channel facilitates to provide service outputs that consumers value. These service outputs may include but are not limited to bulk-breaking, three-dimensional convenience, waiting and delivery time and collection. In Indian retailing, convenience and merchandise appear to be the most important factors influencing store choice, although ambience and service are also becoming important in some contexts. Modernisation will have to address convenience issues while presenting strong alternatives to the weaknesses of traditional formats in selection of merchandise available for sale. Modern formats need not be expensive and can offer lower prices to consumers. Lower prices in turn will increase the attractiveness of modern formats and rapid growth in the preference for purchasing from new format stores.

Store ambience includes issues such as lighting, cleanliness, store layout and space for movement. Modern stores can offer a far better ambience compared to traditional stores. On the service front, traditional stores offer credit and home

delivery. These needs will have to be addressed by new format. Experience from Brazil shows that the combination of entertainment and shopping provided by some shopping centres, is attractive to consumers. This may become important in India as well because of the limited entertainment options currently available in cities. While consumer needs, attitudes and behaviour will influence the development in retail; it is likely that investments in retailing and the creation of new stores offering value will in turn influence consumers. This appears to have happened in Greece, Thailand and Brazil.

#### Influence of Fashion

Fashion has played a key role in shaping apparel consumers. With the change in lifestyle, fashion in India is becoming more stratified, as in the West. Technology, ideas and lifestyles are moving concurrently, and speedily. Companies and brands that offered uninteresting, mundane products for years have now tripled their product ranges and new appealing shapes and forms are being launched each season. Top notch professional bodies in fashion trade are now working towards developing the fashion supply chain through backward linkages with suppliers and mills, and forward linkages with the retail and distribution network.

#### Changes in Government Policies

The Indian government has clarified on a number of occasions that foreign direct investment will not be permitted in India in multi-brand retailing. Major international retailer organizations

will be watching for signals of policy change especially because China has permitted foreign investment in retail. In opening up the retail sector, the government may consider various approaches such as insisting on joint ventures, limiting the foreign stake, or specifying the city areas where investment is permitted. Thailand's example shows that in case of joint ventures, the local partner can play a significant role in the success of the joint venture. Some policy protection can be given to consumer cooperatives which have been providing value to their members and customers. This protection can be in the form of allowing these organizations to access capital from the local market and operate in a more professional manner. The government can also play a positive role in simplifying or eliminating the plethora of regulations governing retailing. Specific laws relating to franchising will also be desirable for foreign and Indian brand owners to adopt the franchise route in a bigger way. According to the new directive of Indian Govt, foreign chains selling single brands were allowed to take up to 51% in Indian joint ventures.

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# 9

## Book Review

### WE ARE LIKE THAT ONLY Understanding the Logic of Consumer India

Kikayangla Longkumer  
Audit Analyst  
Grand Thornton SSC

WE ARE LIKE THAT ONLY- Understanding the Logic of Consumer India is a highly analytical book about the Indian market by Rama Bijapurkar.

"The Indian market is about a lot of people consuming a little bit each that adds up to a lot,... the Indian DNA is about continuity with change; it is about 'THIS as well as THAT'; about cobbling together clever and low-cost solutions that are ingenious combinations and adaptations of products available in the market".

What makes India a place of opportunities in market space is well explained by Rama in this book. Consumer India's nature, characteristics, aspirations exist in real time, having impression of emerging markets. India with significant uneven income groups must not be mistaken with other emerging markets or put in the likes of how developed markets behaved when they were emerging. Rama's demographics about India is too informative and can very well redirect to the notion that for high aspiring markets like India, without crafting optimum strategies carefully considered, can fail global marketers to enter into the country. Proper examples make the book more interesting to read and open up facts like secrets.

The book deals with the structure of the Indian consumers, the reason behind why the Indian market is 'like that only' and what it takes to stay in the market. Thousands of international brands have come to the Indian market in a hope to find a billion-plus market only to be faced by consumers who bargain for everything and anything.

The Indian market goes against the conventional perceptions of an emerging market. This leaves the seller with various questions about the Indian market. The answers to this question can be found

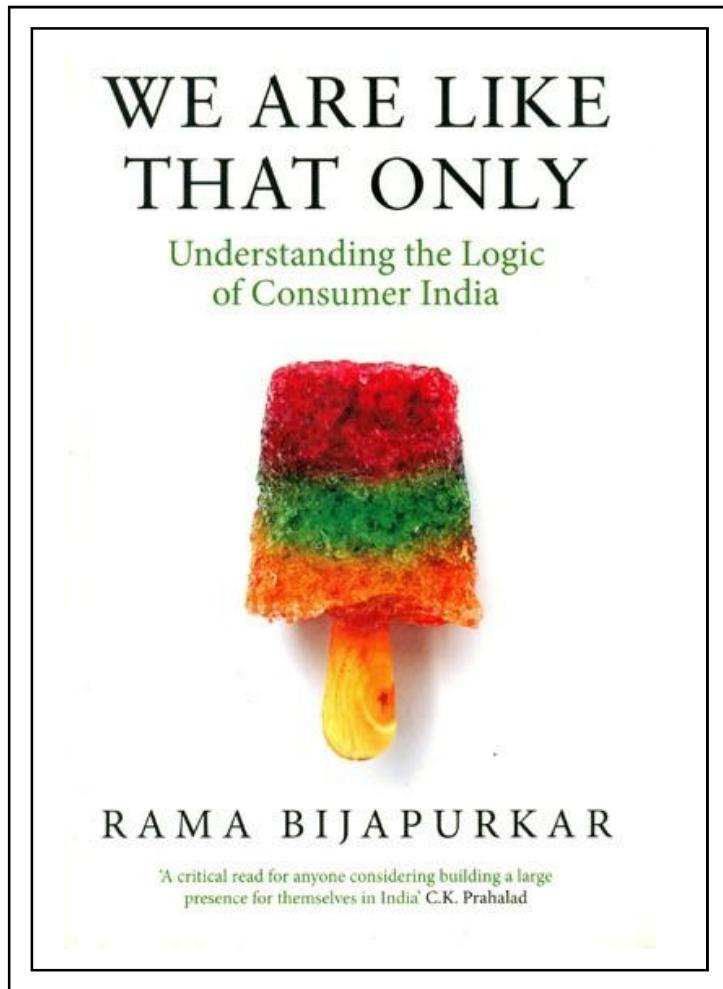
in this book. She sheds light on the twelve key facets of the Indian consumer. These facets include, Consumer India's logic of demand structure; Purchasing power; Consumer India's determinants of Consumption; Schizophrenic India- many Indians, Evolving differently; Cultural foundations of consumer behaviour- technological changes and liberalisation; Levers of growth and transformation - coming of age of young India, changing Indian woman and rural India; The DNA of Indian society- 'This' as well as 'That'; The contradicting Indian consumer; The rural structure of Indian consumer- the changing villager beyond agriculture; The Bottom of the Pyramid (BOP) consumer India; Mixed messages of consumer India; The class and the mass consumer. It clearly explains the total earning of the Indians, and everything else about their consumption-choice, quality, rate, and things that dictate their choices. Written with a powerful language, it presents sure shot strategies to approach the Indian markets and the Indian consumers. This book helps the reader understand the market in a better way.

Much has been said in the past decade and since 1991, about the mammoth consumer market of India and many CEOs of foreign companies have been foolish enough to think of this as a market the size of the U.S., all speaking English and reachable by television. Yet reality soon caught up with them through the slowdown in the late 1990s. What they did not have is an appropriate mental model, a picture that was true to the reality of the Indian market- in terms of both its structure and behaviour. They used analogies, of experience in countries such as Brazil and Thailand to

size the Indian consumer market. She points out that they should have looked beyond the clichés about market segmentation as many are irrelevant to India.

She beautifully points out the fallacies that foreign chief executives wanting to tap into India have as to the market and about the rural foray.

The concepts may seem repetitive for some but personally, I found the book to be very detailed and informative, and only wished that Economics books were written like this for us to be more engrossed.



## Call for Papers

### Financial Derivatives Market in India

Risk is a characteristic feature of most Commodity and Capital Markets. The immediate last two decades have seen many fold increments in the volume of international trade and business due to the wave of Globalization and Liberalization sweeping the world. This has prompted fast and erratic variations in financial assets prices, interest rates and exchange rates. In this way, the corporate world is exposed to an inconvenient financial risk. In the present exceptional uncertain business situation, the significance of risk management is much more noteworthy than at any other time in the history. The emergence of Derivatives Market is an ingenious feat of financial engineering that provides an effective and less expensive solution to the problem of risk which is embedded in the price unpredictability of the underlying asset. Derivative Financial Instruments are financial products, including Futures and Options, which are derived from underlying financial instruments. The main function of Derivatives is not to regulate shortage or surplus of funds or directly facilitate the transfer of savings to investment, but instead is to manage the risk exposure that arises in connection with the underlying instruments. The prices of derivatives in a transaction are determined by supply and demand of the market, and fluctuate with changes in the market environment, which provide profit-making opportunity for speculators. In India, the emergence and growth of derivatives market is relatively a recent phenomenon. Since its introduction in June 2000, derivatives market has exhibited exponential growth both in terms of volume and number of traded contracts. The market turn-over has grown from Rs.2365 crore in 2000-2001 to Rs.2,64,44,804 Cr. in recent years. Within a short span of twelve years, derivatives trading in India has surpassed cash segment in terms of turnover and number of traded contracts.

Keeping the importance of Financial Derivatives Market in India, the theme of the next issue of AMBER (Vol. 8, Issue. 1, October 2016 - March 2017) is 'Financial Derivatives Market in India'.

### Guidelines for Publication

1. The research paper, case study and book review shall be original using specialized concepts, research methodology highlighting key insights and managerial implications.

2. Manuscripts would be checked for plagiarism.
3. The last date for submission of the manuscripts would be 15th February 2017.
4. Intimation of Acceptance/Rejection would be done by 28th February 2017.
5. No publication fees would be charged.
6. Manuscripts need to be mailed to editoramber@acharyabbs.ac.in
7. The submission must be done in Microsoft Word only.
8. The name of the author, designation, affiliation, mail id and mobile number should be provided in the first page.
9. The second page must contain the abstract and key words. The abstract should be between 150 - 250 words.
10. The third page must contain the title followed by the body of the manuscript.
11. Manuscripts are reviewed through a blind referral system by experts in the subject area. To ensure anonymity, the author's name and other details should only appear on the first page and should not be repeated anywhere else.
12. The body of the manuscript must be justified with a font size of 12 using Times New Roman font. The titles must be boldfaced.
13. The spacing between the lines must be 1.5. There must be no tab for the first sentence of every paragraph.
14. Annexure must be numbered and must follow immediately after the body of the manuscript.
15. The body of the text must contain references as shown in the bracket (Kumar, 2014), i.e., last name/surname of the author and the year of publication.
16. All references have to be arranged in alphabetic order and must be numbered.
17. The internet sources must be placed after other references and must be numbered separately.
18. The reference must be present in APA Format 6th Edition.

Example for Journal: Ampofo, A. (2014). Effects of Advertising on Consumer Buying Behaviour: With Reference to Demand for Cosmetic Products in Bangalore, India. New Media and Mass Communication.(27) 1-21.

Example for Book: Kotler, P. (2000), Marketing Management (10th ed., p. 505). Prentice Hall.

