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Food Safety Regulatory Compliance in India: A Challenge to Enhance Agri-businesses

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ABSTRACT

The present paper is an attempt to understand the level of food safety regulations in food businesses and its compliance in India to assess the prospects of food businesses under the surveillance of India's new Food Safety and Standards Act, 2006. The study finds that in the second quarter of 2006, the country had witnessed a new initiative of enactment of the latest Act, 'the Food Safety and Standards Act, 2006 (No. 34 of 2006), under the Ministry of Health and Family Welfare that integrates the existing eight of the food laws. It brings about one statute under a single apex regulatory authority known as Food Safety and Standards Authority of India (FSSAI). The study also highlights that food safety law is poorly implemented in the country specially in case of marketing of fruits and vegetables. The availability of modern infrastructure like scientific ripening chambers for fruits and vegetables has not been provided by the local Government even in modern markets. The lack of scientific ripening chambers to meet international safety standards in the modern market clearly indicates that even in the modern markets of India food safety issues appears to be neglected. It is suggested that there is a strong need to have (i) Special budget for building soft and hard infrastructure; (ii) Attract more Private-Public-People partnership to undertake awareness programmes, sensitisation and capacity building on risk communication in both perishables and non-perishables food items; (iii) Set up accredited network of laboratories with skilled manpower to conduct scientific testing for the primary perishable agricultural commodities; (iv) APMCs to ensure a premium payment for better quality graded produce to the farmers as an incentive to follow and innovate more of the food safety norms, while providing modern infrastructural facilities to both traders and farmers; and (v) Explore innovative models of management, for instance, the state government may consider pilot project to lease out the regulated market to private agri-businesses. The regulatory authorities in turn assume an advisory and regulatory role to make sure that safety norms in that market are as per the law and provide supporting infrastructure. Build Consumers' Trust by (vi) Gradually introducing city-based scheme to restrict sale of lose food items; (vii) Sensitize public about food-safety risks and possible way out for prevention by involvement of consumer organisations; (viii) Mandatory record keeping by implementation authorities for monitoring, effectiveness of law enforcement and food surveillance activities; and (ix) Encourage prescriptive based sale of controlled chemicals at registered places; (x) Set-up an exclusive committee to frame a set of good and hygienic practices for all activities undertaken in market of fruits and vegetables; (xi) Train and educate farmers on personal hygiene along with safe application of pesticides and efficient spray technology as an attempt to prevent contamination in fields; (xii) Integrate small farm owners and traders in India into food safety and quality networks by establishing more number of supermarkets that may help both managing traceability issue; and (xiii) Generating awareness through learning-by-doing process. The suggestions offered above, if implemented, would lead to fostering agri-business both in the domestic and international markets.

Keywords: Food business, food safety measures, health hazards

JEL Classification: Q13, Q17, O19

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I

INTRODUCTION

Since the end of 1990s, India's economy has grown impressively. It is largely accepted that growth took off mainly due to gradual structural transformation of the India's regulated economy in the post-reform period. While there was a clear change in economic policy towards delicensing and deregulations in the industrial sector, agricultural policy by contrast lacked direction and was marked with confusion (Chand, 2005). Agriculture in India has therefore faced adverse trade environment after the liberalisation process. Today, most of the growth in the economy accounts from services and manufacturing sectors and agriculture is lagging behind. Thus, policy attention is now focusing back on agriculture out of concern about how to improve the agricultural performance, food security and its role in economic development. There is a lot of debate and pressure on undertaking institutional reforms for sustainable agricultural development and poverty alleviation. Much of the emphasis in this regard rests on ways to enhance the level of agribusiness to improve the conditions of Indian agriculture. More recently, with increasing commercialisation of agriculture and integration of domestic markets into global food and agribusiness system, the issue of food safety regulations in the country is becoming a matter of public debate. On one side, India is one of the world's largest producers as well as consumer of food products that has huge potential to contributing to not just the development of its economy but to the development of the global economy. On the other hand, India's capability to supply safe food to regain its growth in agriculture is an important concern.

Internationally, India's presence in the global market in terms of both raw agricultural produce and processed products is growing. Although India attempts to meet food hygiene regulations within the border for the export products, a level of uncertainty and fear of rejection of export consignment at the international border exists as there is a lack of harmonisation of food standard regulations between India and the global world. Nationally, it is no more in India's favour to continue production and supply of food which is 'poor in quality' in the disguise of small producers' set of conditions. Nor can it afford to argue within the country boundaries that the purpose of producing food is to achieve minimum food objective of feeding its billion people population. The nutrition and safe food objective is equally important because unsafe food is making people ill which deepens the burden of poverty (Narain, 2013).

Globally, food needs has gone beyond merely supplying food, to 'safe to eat' (Prakash, 2013). Consumers expect that domestic and imported foods meet the basic quality and safety standards and requirements related to food hygiene, labeling and certification, use of food additives, limits for pesticide residues etc. Scientific developments have allowed a better understanding of the nutritional qualities of foods and their health implications. This has led consumers to become more discriminating

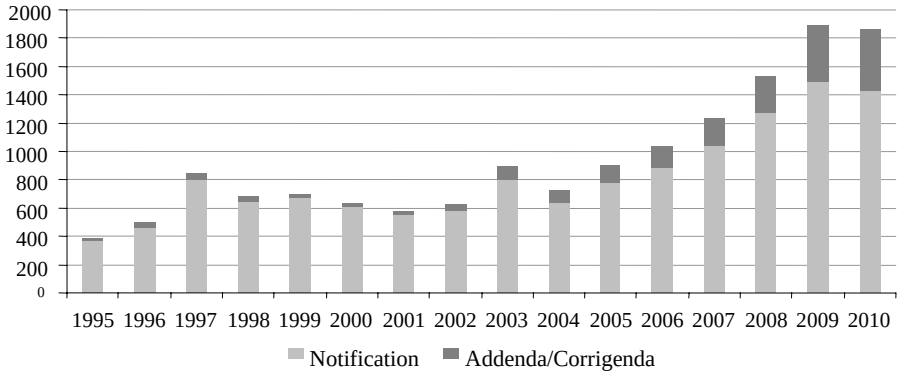
in food matters and to demand protection from inferior quality and unsafe foods (UN-ESCAP, 2008; FAO, 1999). Food safety is developing into one of the most urgent issues that confront the international community due to increasing globalisation of trade in food. While international regulations are available for almost all categories of products, there are variations in regulations followed by individual member nations, including India, as they are free to adopt, modify or have their own regulations (Prakash, 2013). Consequently, it is not unusual that the apprehension about the quality standards of food safety systems of both small and big developing countries like India persist. They are considered not always as well organised and developed as in the industrialised world. A food safety problem in one part of the world, thus, could pose serious concerns for other parts also.

At the same time, food safety in agriculture is becoming a prevalent concern for the Indian agriculture due to the country's several trade obligations under the World Trade Organisation (WTO), particularly, WTO's Agreements on Application of Sanitary and Phytosanitary (SPS) Measures and Agreement on Technical Barriers to Trade (TBT) have significantly altered the international rule-making environment for food safety. The gradual cuts in tariff rates on agricultural products by the developed countries under the Agreement on Agriculture are replaced by higher compliance of a number of technical measures such as food safety regulations, labeling requirements, quality and compositional standards. Figure 1 on rate of notification of technical measures since 1995 to the WTO illustrates the challenges that are growing for India to meet the regulatory requirements of importing countries. In 2010 alone, WTO members notified 1,419 new or amended technical regulations and conformity assessment procedures to the WTO (WTO, *G/TBT/29*, 2011). Failure to meet the standards and exporting poor-quality and unsafe food to developed countries leads to rejection of shipments, depriving it of foreign exchange, causing trade repercussions and loss of income-source for rural and urban workers in agriculture and agro-industrial sectors.

In the light of global perspective of food safety, India has initiated some degree of long-term national strategies to establish its food safety control system. However, there are issues and challenges for India in improving the overall food security of the population and the food trade within as well as outside the country.

It is well-known that the benefits of food safety regulations depend on law-enforcing authorities implementing the regulations and monitoring the compliance. It is crucial to have a good understanding of the level of food safety regulations in food businesses and its compliance in India to assess the prospects of food businesses under the surveillance of India's new Food Safety and Standards Act, 2006. This paper therefore aims to assess the level of food safety regulations in India in terms of its harmonisation with international standards. In particular, we attempt an appraisal of food safety system of India to gauge its effectiveness and response to the changing face of global agri-business. We focus on the level of food safety norms for domestic

and international trade and adequacy of infrastructure for scientific food handling to our analysis.



Source: WTO, G/TBT/29, Sixteenth Annual Review of the Implementation and Operation of the TBT Agreement, March 8, 2011.

Figure 1. Notification of technical measures to WTO, 1995-2010

The plan of the paper is as follows: Section II describes the approach of the paper and data reference. Section III reviews the Food Safety Objective (FSO), a standards-related process adopted by the developed countries. The fourth section assesses the infrastructural capability of the Indian food safety regulations and implementation of the norms by the use of a case on ripening chambers for fruits and vegetables in arid India. The last section explores the potential options and opportunities to improve food safety system of India effectively.

II

APPROACH, RATIONALE AND METHOD

In this paper, we use primary and secondary sources of information as evidence to study and assess some of the key features of the food safety standards of India's informal (local agricultural produce marketing) and formal (agricultural exports) agri-businesses. The paper uses information on (i) collection of records of irregularities in artificial ripening of fruits across Indian states, reported in key national dailies specifically in 2010. The year 2010 was chosen to trace the food safety events in the country through national dailies to be able to link food safety events with the new statute 'Food Safety and Standards Act, 2006 (No. 34 of 2006), enacted under the Ministry of Health and Family Welfare, (ii) adequacy of marketing infrastructure to address food safety norms in the agricultural markets, (iii) Number of reported food borne diseases-cum-accidents in arid India with specific focus on urban city in the time-period 2008 to 2010, (iv) The study also make use of a number of import detentions in 2010 by the United States Food and Drug Administration (US FDA):

the only agency which makes such data public through a monthly import detentions list, to assess India's food quality and safety issues in the international food exports. It also considered the number of import rejection of Indian products on account of food safety problems by the EU in the analysis.

For the primary data evidence, the study has selected the capital city of northern state of Rajasthan –Jaipur as it fairly represents a growing urban market set-up that can represent suitable apprentice to examine if urban cities in India are making themselves organised in a way as to meet the rising demand for safer food. In terms of institution for agricultural marketing, Jaipur is one of the few cities that has separate Agricultural Produce Market Committee (APMC) for fruits constituted under the State APMC Act,[1] 1961. It is equipped with state-of-art modern infrastructure facilities, dealing exclusively with marketing of the fruits and vegetables, and the same is emerging for exports of fresh fruits and vegetables. The paper focuses on safer fruits and vegetables because of several reasons: (a) There is structural change in the composition of world trade in agricultural and food products, with exports leaning towards high-value foods such as fruit and vegetables, poultry, and fish (Fafchamps *et al.,* 2006; Athukorala and Jayasuriya, 2003*;* Watts and Goodman, 1997); (b) India is the second largest producer of fruits and vegetables and it forms one of the major agricultural export products. (c) India has come to realise that it can take advantage of international trade liberalisation to export agricultural products but experts view that the ability of India to maintain or expand its world market share will depend on its ability to meet the demands of the world trading system, not only in terms of competitive prices but also quality and safety standards (Henson and Loader, 2001); (d) the pattern of domestic demand is evolving and as India gets richer, consumers are getting more interested in fruits and vegetables and they demand for better and safer food quality. Due to lack of research data over time, the analysis relied on descriptive information and statistics.

III

UN AND WHO GUIDELINES ON FOOD SAFETY

Safety is not defined as a situation with total absence of hazards. According to the Food and Agricultural Organization of the UN and World Health Organisations, food safety refers to all those hazards, whether chronic or acute, that may make food injurious to the health of the consumer (FAO/WHO, 2002). In an increasingly complex system of global food market, any food may become unsafe if it is not produced or handled with proper hygienic practices. In recent past, the instances of food accidents illustrates that once the outbreak of contamination occurs, a complete sanitisation of produce gets difficult and it is not easy to trace the source of the problem within the global food chain system. A food safety problem in one part of the world could have serious implications for many others. In order to combat and manage food borne hazards, monitoring and surveillance through food regulations in

the food production system are therefore considered as a way to reduce the food safety risks or for prevention of food contamination beforehand.

The food industries in several nations are adopting the international concept of Food Safety Objective (FSO)[2] to manage food risks hazards. It is recognised that the entire food chain of production and distribution holds the responsibility to supply safe and healthy food. Efforts are made to harmonise food control legislation between countries to ensure that consumers are assured a certain quality and level of safety wherever that food is produced in the process of globalisation of the food supply (Davies, 2001). In line with the globally accepted norms, many developing countries including India are taking steps to undertake food safety programmes. In India, however, emphasis of food safety control system has been on the exportable food items. The food quality for the export market varies from the food marketed in the domestic market. The level of harmonisation of food safety standards for the domestically marketed produce in India differs extensively, which has implications for agri-businesses. The study has reviewed this in detail in the following section.

IV

INSTITUTIONAL STRUCTURES OF FOOD SAFETY IN INDIA: BRIDGING THE GAP

4.1 *The Indian Food Safety System vis-à-vis International Objective of Food Safety*

Until recently, effectiveness of food control in the Indian domestic market was found to be severely undermined by the existence of multiple jurisdictions, and weaknesses in surveillance, monitoring and enforcement. Several of these food laws were enacted under different ministries in India that had their own rules and orders, which created a perplex and sometime contradictory environment for the food business sector.[3] Thus, despite a notable list of food legislations[4], not much could be achieved in terms of food safety and consumers' protection in the country. In the second quarter of 2006, the country witnessed a new initiative of enactment of the latest Act, 'the Food Safety and Standards Act,[5] 2006 (No. 34 of 2006), under the Ministry of Health and Family Welfare that integrates the existing eight food laws (see Table 1). It brings about one statute under a single apex regulatory authority known as Food Safety and Standards Authority of India (FSSAI) with minor revisions, while adding the key provisions to further strengthen food safety regulation. The Central Government notifies Food Safety and Standards Rules,[6] 2011 on May 5, 2011. This new initiative lays down science-based standards for better food quality control. The Act is based on international legislations, instrumentalities and Codex Alimentarius Commission. It is divided in 12 chapters containing 101 sections and two schedules that provide key provisions to improve food safety in primary food from production to consumption.

TABLE 1. INDIA'S FOOD REGULATORY FRAMEWORK UNDER MULTIPLE MINISTRY

Sl.No. (1)	Food Laws (2)	Implementing Ministry (3)
1.	The Prevention of Food Adulteration Act, 1954 (37 of 1954).	MOHFW [a]
2.	Fruit Products Order, 1955.	MOFPI [b]
3.	Meat Food Products Order, 1973.	MOFPI [b]
4.	Vegetable Oil Products (Control) Order, 1947.	MCFPD [c]
5.	Edible Oils Packaging (Regulation) Order, 1998	MCFPD [c]
6.	Solvent-Extracted Oil, De-Oiled Meal, and Edible Flour (Control) Order, 1967	MCFPD [c]
7.	The Milk and Milk Products Order, 1992.	MOAGL [d]
8.	Any other order issued under the Essential Commodities Act, 1955 (10 of 1955) relating to food.	Inter-ministerial through issuance of control orders

Source: www.fssai.gov

Note: a Ministry of Health and Family Welfare.

b Ministry of Food Processing Industries.

c Ministry of Consumer Affairs, Food, and Public Distribution.

d Ministry of Agriculture.

e Ministry of Women and Child Development.

The excerpts from the Act such as the Chapter IV, Section 19-25 of the Act includes some of the key provisions to improve food safety in primary food from production to consumption. For instance,

(1) Section 21 of the Act states that foods are not to contain any insecticides or pesticides residues, veterinary drugs residues, antibiotic residues, solvent residues, pharmacological active substance and micro-biological contaminants in excess of limits prescribed under the regulation. One important clause of the Act imposes liabilities on the manufacturers, packers, wholesalers, distributors and sellers if a food article fails to meet the requirements of this Act. It provides for graded penalties where offences of manufacturing, storing or selling of misbranded or sub-standard food is punished with fine, and more serious offences with imprisonment. The Act also compels the establishment of food recall procedures.

The enactment of the new comprehensive legislation is a clear indication of progressive change in the Indian food regulatory system. The Act discernibly embraces the concept of International Food Safety Objective (FSO)[7] that offers flexibility of food safety operation to the Indian food businesses to manage food risks hazards in the global competitive market. The Act and Rules enables regulators to better develop and implement inspection procedures to assess the adequacy of control measures implemented by the businesses. For instance, the Act aims to register/issue licenses to all the food business operators in the country including the small, medium or even temporary vendors in streets, in order to trace and control quality of food. In this context, as per Clause No. 1.2.1(5) of FSS (Licensing and Registration of Food Businesses) Regulation, 2011, State Food Safety Commissioner may involve officials

of Panchayat, Municipal Corporations, NGO or any other local body in an area as registration authority under the Act.

In terms of enforcement of the FSS Act, 2006 at the state level, we get a mixed picture. Table 2 presents de jure appointment status of the officials to operationalise the Act. The official document notes that almost all states have appointed Food Safety Officer and started operation of license and registration of food business operators in the states. Availability and accessibility of food labs for implementation of FSS Act can be gauged from information given in Annexure I. There are only 70 labs existing in the country, out of which, nearly 27 per cent are in Maharashtra alone and another 41 per cent are located only in five States, viz., Andhra Pradesh, Gujarat, Rajasthan, Tamil Nadu and Uttar Pradesh. The spread of food labs in the country has been observed as uneven and there is absence of food labs in 10 States and UT. The availability of food lab in relation to agricultural production has been observed to be not even one for handling agriculture and horticulture produce. Similarly their accessibility in terms of availability of food labs per '00 sq.km. works out to 0.002128. This indicates the basic infrastructure for implementation of provision of FSS Act is abysmally low. Nonetheless, the process and progress of implementation of the FSSAI is extremely slow. Although it has been more than six years since the establishment of the FSSAI, the result framework document (RFD) for the food sector is yet to be completed. In fact, development of rules, regulations and guidelines to enforce and implement most of the provisions and objectives of the RFD is yet to be drafted. Such marked delays have direct implications on the ground, which we discuss in the next sub-section. One official data show that the expected number of food business operator to be licensed or registered under FSS Act, 2006 is approximately 5.5 crore, but till date only 2 per cent target is achieved.

TABLE 2. ENFORCEMENT OF FOOD SAFETY ACT, 2006

Food Safety Commissioner (1)	Appointed in all States/UTs (2)
Designated Officer	Appointed in all States/UTs (to confirm Qualifications)
Food Safety Officer	Appointed in all States/UTs except Daman & Diu and Sikkim
Special Cadre	States to provide their Food Safety Organisation Structure
Adjudication Officer	Appointed in all States/UTs except Arunachal Pradesh, Assam, Chandigarh, Dadara & Nagar Haveli, Daman & Diu, Jharkhand, Kerala, Meghalaya, Mizoram, Nagaland and Orissa
License & Registration	Started in all States/UTs except Delhi, Lakshadweep, Manipur, Orissa and Nagaland
Sample Collection	The following States have not started with the food sample collection process: Assam, Haryana, Himachal Pradesh, Kerala, Madhya Pradesh, Manipur, Nagaland, Orissa, Punjab,Rajasthan, Sikkim and Tripura
Steering Committee	Constituted in Meghalaya, Tripura, Mizoram and Andaman & Nicobar Islands. In Uttarakhand only State level Steering Committee has been constituted. Himachal Pradesh is in process of constituting the Committee.
Tribunal	Established in Tripura, Delhi, and Andhra Pradesh. Maharashtra, Chattisgarh, Gujarat, Uttar Pradesh and West Bengal are in the process of establishing Tribunal.

Source: Food Safety and Standards Authority of India, 2013.

4.2 *Implementation for Food Safety in Agricultural Produce: Present Indian Scenario*

With much effort so far in laying down the legal food standards by the Indian Government and the legislative body, the issue of implementation of the orders and instructions by the authorities remains a concern. The Prime Minister of India initiated the process of the new Act in 2002 by constituting the task force to review India's food and agro industries management policy. For time needed before the new Food Safety and Standards Act with rules is enforced, existing rules and regulations under the number of Acts of different Ministries continued to be in force. The initiative per se was a clear spelt-out to all concerned departments of food regulation across the country that food safety in the Indian states is a major problem in food businesses. All states must ensure consumer protection and ensure overall food safety through standards and guidelines in relation to safe food compliance. On the contrary, we document a number of cases relating to artificial man-made contamination of food with pesticide residue, heavy metals and mycotoxins bringing a great menace to the health and well-being of the local community in the country, even during the years of run down to adoption of the new Act. The food safety initiative did not work as a deterrent for those food handlers who knowing or unknowingly caused unsafe and unhealthy food in the food market. The study has collected the evidence of abuse of food safety norms and incidence of food-borne illness to highlight the potential lapse on the implementation of food safety norms and regulations.

In June 2010, the Union Health Ministry of India asked the state authorities to keep a strict vigil on the use of carbide gas[8] for ripening fresh raw fruits. It is a common local market knowledge that traders, retailers and sometimes even growers use unscrupulous methods to ripen fruits artificially in order to ensure a regular supply of fruits much before their due time and get high prices for them. Under the Rule 44 AA of the Prevention of Food Adulteration (PFA) Rules, 1955, use of such chemicals is prohibited in India. The Ministry issued a circular to all state food authorities, with the Food Safety and Standards Authority of India (FSSAI) stressing the need to take legal action for violation of the PFA rules. The Ministry announced that sale of any adulterated and misbranded article of food was an offence punishable with minimum imprisonment of six months and with a fine that shall not be less than INR 1,000. In case adulterated food stuff causes death or grievous hurt, the offence was punishable with imprisonment which might extend to term of life and with fine which shall not be less than INR 5,000. Enforcement authorities in the states have been informed that circumstantial evidence of presence of calcium carbide in godowns/wooden crates/premises kept together with fruits may be evidence of artificial ripening for the courts. The FSSAI also circulated a copy of procedure for detection of acetylene in godowns or treatment chambers.

In our review of select cases of marketing of unsafe fruits and vegetables reported in national dailies since 2010 and other private studies, we find that food safety law is poorly implemented in the country. There is no access to official public records of the

cases but reported news items and research studies in Table 3 may represent current practices in implementation of food safety norms in the country. The news covered in the national dailies reveal that food safety law is violated under the administrative parlance of domestic regulated wholesale markets. It seems that officials pay little attention to accepted protocols and food regulations because of low level of awareness amongst them about safe food ripening procedures. It is possible that clear

TABLE 3. CASES OF SALE OF UNSAFE FRUITS AND VEGETABLE IN THE DOMESTIC MARKETS OF INDIAN STATES

Sl.No. (1)	State (2)	Hazard category (3)	Products involved (4)	Place of irregularity (5)	Culprits (6)	Source and date of reporting (7)
1.	Vasco, Goa	Use of chemical 'calcium carbide (powder) for artificially ripening	mangoes and other fruits	Three Fruit Go-downs of the Regulated wholesale market*	Private traders	The Navhind Times, June 17, 2010
2.	Kanpur, Uttar Pradesh	Illegal use of carbide gas for artificially ripening	mangoes and banana	Regulated wholesale market	N.A.	Times of India, July, 12, 2010
3.	Jaipur, Rajasthan	Use of chemical 'calcium carbide (powder) for artificially ripening	Mangoes and papayas	Regulated Fruits Market	Private traders	Times of India, July 21, 2010
4.	Delhi	toxic chemicals and maximum residual limits level of pesticide	Vegetables	Regulated wholesale market premise and other retail markets	Private Traders	Vegetables, India's poisoned staple, Consumer voice, vol Xi, Issue Xi , November 2010
5.	Ludhiana, Punjab	Indiscriminate use of banned chemicals and gases for ripening fruits in ripening chambers	bananas, mangoes, musk melon, water melon and papaya	Regulated wholesale market	Private trader known to district mandi officer	Times of India, April 8, 2011
6.	Hyderabad, Andhra Pradesh	Use of chemical 'calcium carbide (powder)	mangoes, bananas and papayas		Traders	Deccan Chronicle, April 11, 2011
7.	Bangalore, Karnataka	Contamination with pesticide residue higher than danger level	leafy vegetables	Poor agricultural production practices	Farmers	University of Agricultural Sciences, Bangalore
8.	Varanasi, Uttar Pradesh	Environmental pollutants	Green vegetables	Regulated wholesale market premise	Environmental issue	Cited in book, Is it Safe? By Soumi Home Roy, 2005

*Regulated wholesale market means market established under the APMC Act, administered by the State government, Ministry of Agriculture.

guidelines are needed to meet the food standards, as both the marketing officers and the food handlers are not aware or educated enough to follow globally accepted norms of safe food. It is important for the local government to adopt and implement national food safety standards based on the international recommended Codex Alimentarius Commission standards and codes of practice.

Unsafe food is a cause of high levels of food insecurity and ill-health. Food-borne illness is a serious health hazard and its incidence can go high in unprotected environments that we find in poor and under-developed areas in the country. There is an additional burden of economic loss due to negative impact on food trade, both domestic and international. Although it is difficult to estimate the extent of total economic loss owing to lack of sufficient supportive data, we assess the health problem in the study area by looking at number of reported food borne infections in arid India. The health records were collected from the public agency for the year 2008 till 2010, as shown in Table 4. The figures in the table indicate the growing problem of poor public health due to food borne diseases. There is possibility of under-reporting of the potential problem as the extent of infection might not be monitored owing to poor surveillance and in many cases go unreported.

TABLE 4. REPORTED FOOD BORNE INFECTION IN JAIPUR, OUTBREAKS INVESTIGATED 2008 TO 2010

Year	Gastroenteritis	Food poisoning	Diarrohea and acute vomiting
(1)	(2)	(3)	(4)
2008	6835		
2009		72	333
2010			2022

Source: Health Officer, Municipal Corporation of Jaipur, Rajasthan, India, May 2011.

The major problem with fresh fruits and vegetables across Indian states is that of their artificial ripening by the use of toxic and banned chemicals. We therefore investigated the availability of suitable infrastructure like modern scientific ripening chambers for fruits and vegetables as a case-study of Jaipur district. Incidentally, it is found that there is no facility of a ripening chamber provided by the local government, although it provides other modern marketing infrastructure as is evident in Table 5. In the private sector, two ripening chambers with about 50MT capacity per day have recently come up in Jaipur city. The lack of scientific ripening chambers to meet international safety standards in the modern market (see Table 4) clearly indicates that even in the modern markets of India food safety issues appears to be neglected.

The study further attempts to assess the level of food safety issue in the country by looking at the adequacy of number of food licenses issued by the state food inspectors as per the Prevention of Food Adulteration Act (PFA), 1954 in the case of Jaipur city. No office was found to keep category-wise record of licenses issued under the PFA Act. The concerned officer mentioned that licenses are procured mainly for operations in food processing units, hotels, and restaurants and there is

TABLE 5. INFRASTRUCTURAL FACILITY IN PACK HOUSE AT THE MAIN WHOLESALE MARKETS OF THE JAIPUR DISTRICT, APRIL 2011

Wholesale market	Types of infrastructural facility	
(1)	(1)	(3)
Pack House at Chomu	Cold rooms palletisation and storage of total 120 MT capacity	Mechanised sorting and grading line which includes plastic pallet and crates, onion topper, tumbling and cascading, length grader, un-loaders, gravity roller conveyor, washing tank, elevator conveyor roller conveyor, semi automatic and automatic grading line, packing tables, gravity roller conveyor, washing tank, elevator conveyor roller conveyor, semi automatic and automatic grading line, packing tables. Reefer Van 12 MT capacity DG Set
Pack House at Muhana	07 Cold rooms for palletisation and storage of total 280 MT capacity	
Pack House at Shahpura	Cold rooms palletisation and storage of 120 MT capacity	

Source: Fresh Fruits and Vegetables and R&D, Agricultural and Processed Food Products Export Development Authority (APEDA), New Delhi, May, 2011.

none-to-low awareness about the food safety norms present in fresh fruits and vegetables. The field visits[9] at the Muhana wholesale market of fruits and vegetables in Jaipur also revealed that ripening of fruits and vegetables are carried out by adopting traditional practices of use of calcium carbide powder and smoke-n-ice methods. To be the objective in assessing the level of food safety standards, it was decided to attribute about ten per cent licenses of the total PFA licenses to meet safety norms in the wholesale market of the fresh fruits and vegetables in the Jaipur city. Our approximate estimation suggests that one PFA license holder handles 1175 quintals of fruits and 2775 quintals of vegetables together everyday in the Jaipur wholesale agricultural market, as shown in Table 6. Though the hypothetical estimation is crude, the probable value predicts high level of institutional inadequacy in administrating food safety standards in the fruits and vegetable markets in the present modern market of urban cities of India.

TABLE 6. INSTITUTIONAL INADEQUACY FOR EXECUTING FOOD SAFETY NORMS IN JAIPUR MUHANA WHOLESALE MARKET OF FRUITS AND VEGETABLES, 2010-11

Arrival Fruits (qtl.)	Arrival Vegetables (qtl.)	No. of food handlers (traders, agents)	Total PFA license (urban and rural)	Fruits qty. per food handler (qtl.)	Veg. qty. per food handler (qtl.)	10 per cent of PFA license
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2538057	5994636	2160	6986	1175	2775	699

Source: Data on arrival and food handlers is collected from Rajasthan Agricultural Produce Market Committee, Jaipur. Number of PFA license is sourced from the office of Municipal Corporation, Jaipur, May 2011.

We examine the level of food safety issue further in the case of food export markets. We investigate if basic infrastructure facilities are poor in the modern domestic agricultural markets, do they affect India's performance of the food exports as well? We look at the import detentions by the EU and US authority. Table 7 indicates rejection of exports of agricultural and food products of India to the EU as a direct result of SPS requirements for the period 2008 to 2010. Similarly, the data

from FDA detention lists for the period 2010 for imported food from India is given in Table 8. The majority of detentions and rejections of foods from India are not related to highly technical or sophisticated requirements. At the top of the list stand food hygiene problems represented by microbiological contamination and pesticide residues. Food additives comes next, followed by failure to limit filth not elsewhere classified (insect, bird rodent), and then mandatory labeling. The consideration with the import detention data is that they are count data and do not reflect the dollar value of Indian food products refused entry to the EU and United States or the rate of detention relative to the volume of trade. The value of detained product relative to the value of imports is the most direct measure of the challenges encountered at border inspection. Unfortunately, this measure cannot be calculated due to the lack of value data for detained shipments. Nonetheless, to a large extent, this information reflects the fact that poor food safety control system in the domestic market of India act to impede its exports of agricultural and food products. Dealing with these is well within the means of India and would go a long way in promoting its export trade.

TABLE 7. NUMBER OF CONTRAVENTIONS CITED FOR EU (EUROPEAN UNION) IMPORT DETENTIONS OF INDIAN FOOD PRODUCTS AND THEIR RELATIVE IMPORTANCE FOR THE PERIOD 2008-2010

Reason for contravention	2008	2009	2010
(1)	(2)	(3)	(4)
Food Additives and Heavy Metals	9(13.4%)	10(20%)	8(13.3%)
Pesticide residues	9(13.4%)	14(28%)	38(63%)
Microbiological contamination and Decomposition	41(61.2%)	23(46%)	9(15%)
Filth, adulteration, insect	2(3%)	3(6%)	5(8.3%)
Labelling	6(9%)		
Totals	67(100%)	50(100%)	60(100%)

Source: Authors' calculation, based on information available from Agricultural & Processed Food Products Export Development Authority (APEDA), New Delhi, May, 2011. APEDA receives such information from limited exporters voluntarily and many of the cases may go uniformed in the country. There is no mandatory process of record-keeping.

TABLE 8. US IMPORT DETENTIONS FOR INDIAN FOOD CONSIGNMENTS, JANUARY-DECEMBER, 2010

	India	RoW*		India	RoW		India	RoW		India	RoW
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
January	165	1400	May	147	1622	Sept	182	1713	2010	2041(11%)	18245
February	195	1170	June	107	1443	Oct	182	1583			
March	201	1421	July	155	1565	Nov	250	1711			
April	113	1272	August	170	1538	Dec	174	1809			

Source: Authors complied from US FDA Import Detention Reports, January to December 2010: the only agency which makes such data public through a monthly import detentions list. *Number of detained products are much higher than number of shipments/consignment. *Rest of the World.

4.3 *State of Food Market and Economic Cost of Regulatory Processes*

There are fundamental shifts occurring in agro-businesses in Asia. The trend of building partnerships and alliances is increasing. Competition is being replaced by co-ventures leading to win-win game. It is observed that these linkages improve

efficiency in the production and marketing of food products. The benefits of partnerships are recognised by global players. Instead of setting up an isolated top-to-toe supply chain unit exploiting strengths and resources of partner organisation leads to significant gains to those along the chain. For instance, Bharti-Wal-Mart has set-up a joint venture to run agricultural distribution network in India. In this venture, Bharti[10] brings in their intimate knowledge of doing business in India, whereas Wal-Mart brings in their expertise in strategic sourcing and efficient supply chain management practices. The experts view it as good business model which effectively overcome the inefficiencies of logistics infrastructure and which supposedly benefits all the stake-holders in the supply chain, right from farmers to the consumers (Wal-Mart 2010). The business forecast suggests that the opportunities like the one in India are immense. The McKinsey Global Institute, a think tank, estimates India's retail market will be worth $1.52 trillion by 2025 (Robinson, 2007). But, on the contrary it is also argued that building a modern, efficient network is not enough to reap the estimated gains but the challenge lies in adapting it to Indian conditions. At present, India has one of the most fragmented produce-supply chains amongst the countries, resulting in big mark-ups and poor quality. The difficult part is regular supplying food-stores with fresh, clean and safe vegetables and fruits through a sophisticated supply chain that links farms and consumers, country and cities. Moreover, a report by the Confederation of Indian Industry (CII) and Amarthi Consulting summarises that $65 billion is lost each year on account of the inefficient supply chain infrastructure in India. The report highlights that supply chain costs in India are as much as 13 per cent of gross domestic product (GDP) as compared to 7 per cent in developed countries. The lack of an integrated cold chain infrastructure means that farm produce worth $13 billion is wasted each year. It warns that if the present challenges in India’s supply-chain system are not addressed, then the sector’s growth could get hampered (The Economic Times, 2010). With increased public awareness about food safety, internationally consumers want to know the source of food production and demand assurance that it is safe. Without immediate action for safe food, the chain of supermarkets would prefer to procure more of imported fruits and vegetables from neighbouring countries than procuring the supply from the local market. It is a known fact South East Asian region (Thailand, Vietnam, Malaysia, Philippines, Indonesia, China) are advancing well in agri-food chains and they are supplying perishable food products around the world at fairly competitive prices. The Indian states whose economy is dependent on tourism and services also need to be extra cautious on the availability of food safety norms because the cases of food hazard in the country not only can damage trade but also tourism prospects can be marred leading to loss of earnings, unemployment and litigation.

V

CONCLUSION

The Indian Government has enacted several laws under different ministries to establish quality and safety in country's food management systems. In practice, the status of food safety standards is obscure due to poor enforcement of laws which appear to render weak regulatory environment in the food sector of India having implications for growth and employment prospects. The study attempts an appraisal of the Indian food safety regulation in terms of its effectiveness and its response to changing face of global agri-business through a case-study approach. The data on regulatory inadequacy on food safety standards shows that majority of detentions and rejections of foods from India are not related to highly technical or sophisticated requirements but the concerns almost relate to food hygiene problems arising from failure to meet SPS standards of the WTO. The evidence indicates that strengthening domestic market for the food safety standards is important prior to expecting the markets' supply chain to adapt to international standards of the food safety. Moreover, long term fostering and sustenance of the trade competitiveness of agri-businesses would require perceived transparency of regulatory processes and the risk communication policy. The trust in government institutions such as the Food Safety and Standards Authority of India (FSSAI) by implication would strengthen the consumers' confidence in the food supply system and by virtue of the feedback impact would make considerable impact on the potential and prospects of the country's agribusinesses. Based on analysis, the paper arrives at the three-prong strategies as follows:

1. *Proposals for Enhancing the Trade Include:* (i) Special budget for building soft and hard infrastructure; (ii) Attract more Private-Public-People partnership to undertake awareness programmes, sensitisation and capacity building on risk communication in both perishable and non-perishable food items; (iii) Set up accredited network of laboratories with skilled manpower to conduct scientific testing for the primary Perishable Agricultural Commodities; (iv) APMCs to ensure a premium payment for better quality graded produce to the farmers as an incentive to follow and innovate more of the food safety norms, while providing modern infrastructural facilities to both traders and farmers; and (v) Explore innovative models of management, for instance, the state government may consider a pilot project to lease out the regulated market to private agri-businesses. The regulatory authorities in turn assume an advisory and regulatory role to make sure that safety norms in that market are as per the law and provide supporting infrastructure.

2. *Proposals for Building Consumers' Trust Include:* (i) Gradual city-based scheme should be started to restrict sale of loose food items; (ii) Sensitise public about

food-safety risks and possible way out for prevention by involvement of consumer organisations; (iii) Mandatory record keeping by implementation authorities for monitoring, effectiveness of law enforcement and food surveillance activities; and (iv) Encourage prescriptive based sale of controlled chemicals at registered places.

3. *Proposals for Educating Traders and Small Farmer Include:* (i) Set-up an exclusive committee to frame a set of good and hygienic practices for all activities undertaken in market of fruits and vegetables, adopting a strategic view and consult widely with all sectors of the food chain and interest groups across the country; (ii) Farmers to be educated and trained on personal hygiene along with safe application of pesticides and efficient spray technology as an attempt to prevent contamination in fields; (iii) Integrate small farm owners and traders in India into food safety and quality networks by establishing more number of supermarkets that may help both managing traceability issue and awareness generation through learning-by-doing process; and (iv) Programmes through mass media like TV, Radio, mobile SMSs to sensitise both farmers and all relevant stakeholders on the issue need to be undertaken.

NOTES

1. The State APMC Acts establishes the agricultural produce markets in the state and provides for their regulation to achieve an efficient system of buying and selling of agricultural commodities.

2. The concept allows to the application of the principles of Good Hygienic Practice (GHP), Hazard Analysis Critical Control Point (HACCP) systems, Good Agricultural Practice (GAP) performance criteria, process/product criteria and/or acceptance criteria (FAO/WHO, 2002) and other protocols introduced by Codex Alimentarius and International Standard Organisation (ISO). The most recent standard protocol is ISO22000 that is directly associated with supply chain management in context of food and agri-business.See FAO and WHO, 2002, 2003 for details on FSO; Alberni *et al.*, 2008; and Cole 2004 for concept and application.

3. See Report on Implementation of FSSA: An Industry Perspective, FICCI 2007 at http://www.indiaenvironmentportal.org.in/files/Food_Safety_Study.pdf.

4. Good overview on the main Indian Acts and statutory orders to regulate food trade in India is available in Acharya and Agarwal 2009, p.316-317, p.337-345.

5. See Palthur, *et el.*, for review of the new Act.

6. The Food Safety and standards Rules, 2011 are available at http://www.fssai.gov.in/Portals/0/Pdf/FSS_Rules_2011_English_06-05-2011.pdf (accessed on May 10, 2011).

7. See FAO/WHO Report, 2002 and Cole, 2003 for concept; See Alberni *et al.*, 2008; Raspor, 2008; and Wallace in Mayes and Mortimore (Ed), 2001 for application.

8. Medical science finds calcium carbide, popularly known as 'masala' in Indian markets, causes cancer. Used in gas welding for steel goods, it also causes mouth ulcers, gastric irritation, even food poisoning. Some vendors also dip fruits in a solution of ethephon or expose the fruits to ethylene gas to speed up ripening. See Ashraf Ur-Rahman *et al.*, 2008 for health hazards associated with carbide; see WHO, 2007 factsheet on Food safety and food borne illness.

9. Repeated visits were made in April 2011.

10. Bharti Enterprise is a pioneer in telecommunication sector in India and the group has started to enter into new business areas such as insurance and retail.

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ANNEXURE I

AVAILABILITY OF FOOD LABS AND PHYSICAL ACCESSIBILITY IN INDIA – 2012

		No. of	
State/UT	Food Labs	Food Labs '000 MT	Food Labs '00 Sq.Km.
(1)	(2)	(3)	(4)
Andhra Pradesh	6	0.0003	0.002
Arunachal Pradesh	0	0.0000	0.000
Assam	1	0.0002	0.001
Bihar	1	0.0001	0.001
Chhattisgarh	1	0.0001	0.001
Goa	1	0.0072	0.027
Gujarat	6	0.0004	0.003
Haryana	2	0.0001	0.005
Himachal Pradesh	1	0.0007	0.002
Jammu and Kashmir	0	0.0000	0.000
Jharkhand	1	0.0002	0.001
Karnataka	2	0.0002	0.001
Kerala	4	0.0070	0.010
Madhya Pradesh	1	0.0000	0.000
Maharashtra	19	0.0010	0.006
Manipur	0	0.0000	0.000
Meghalaya	1	0.0038	0.004
Mizoram	0	0.0000	0.000
Nagaland	0	0.0000	0.000
Orissa	1	0.0002	0.001
Punjab	1	0.0000	0.002
Rajasthan	6	0.0002	0.002
Sikkim	0	0.0000	0.000
Tamil Nadu	6	0.0005	0.005
Tripura	0	0.0000	0.000
Uttar Pradesh	5	0.0001	0.002
Uttarakhand	1	0.0005	0.002
West Bengal	1	0.0001	0.001
Andaman and Nicobar Islands	0	0.0000	0.000
D & N Haveli	0	0.0000	0.000
Delhi	1	0.0065	0.027
Daman and Diu	0	0.0000	0.000
Pondicherry	1	0.0054	0.209
All India	70	0.0002	0.002

Note: Compiled from the information collected from FSSAI, New Delhi.