

1 Introduction

“In a world of plenty, no one, not a single person, should go hungry. But almost 1 billion still do not have enough to eat. I want to see an end to hunger everywhere within my lifetime.”

– *Ban Ki-moon, United Nations Secretary-General*

“Imagine all the food mankind has produced over the past 8,000 years. Now consider that we need to produce that same amount again — but in just the next 40 years if we are to feed our growing and hungry world.”

– *Paul Polman, CEO of Unilever, and Daniel Servitje, CEO of Grupo Bimbo*

Concepts of food security have evolved in the last thirty years to reflect changes in official policy thinking (Clay, 2002; Heidhues et al, 2004). The term first originated in the mid-1970s, when the World Food Conference (1974) defined food security in terms of food supply - assuring the availability and price stability of basic foodstuffs at the international and national level: “Availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices.

“Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (World Food Summit, 1996).

Food security means availability, accessibility and affordability of food to all people at all times for a healthy life (ICN 1996). This widely accepted World Food Summit (1996) definition reinforces the multidimensional nature of food security and includes food access, availability, food use and stability. It has enabled policy responses focused on the promotion and recovery of livelihood options. At the household level food security is defined as “access to food that is adequate in terms of quality, quantity, safety and cultural acceptability at the household level” (Gillespie and Mason 1991).

In India the government has followed a consistent policy of ensuring food security for its people. The genesis of this lies in the chronic food shortages, famines and starvation witnessed in parts of the country during early years of independence. The fundamental right to life enshrined in Article 21 of the Constitution has been interpreted by the Supreme Court and National Human Rights Commission to include right to live with human dignity, which includes the right to food and other basic necessities. Under Directive Principles of State Policy, it is provided under Article 47 that that the State shall regard raising the level of nutrition and the standard of living of its people and the improvement of public health as among its primary duties.

Though the country became self sufficient in foodgrain production due to the Green Revolution yet the percentage of people suffering from hunger is large. A series of poverty alleviation programmes were launched to increase the purchasing power in the hands of the people. An ambitious scheme of distribution of foodgrains through the Public Distribution System was launched to ensure regular availability of foodgrains to a large number of consumers throughout the country on one hand and also to provide adequate incentive to the farmers of the country to produce more through a scheme of ensuring minimum support price for their produce. Although these policies have been followed for over six decades now yet the goal of micro level food security for a large section of the population remains a distant dream. India has one of the largest food subsidy programmes in the world that has created a relatively effective social safety net but is also under increasing criticism because of its large contributions to government budget deficits, economic inefficiency and poor targeting. The Food Corporation of India is always under attack from all quarters for perceived operational inefficiencies leading to increase in the food subsidy burden (Sharma,2013). The data on food subsidy clearly shows that subsidy has increased significantly in the post-reforms period in general and during last 6-7 years in particular reaching a record level of Rs. 72283 crore in 2011-12. The total cost of food subsidies that amounted to about 2.2 per cent of agricultural GDP during the 1990s increased significantly to about 5 per cent during the last decade. as can be seen from the data below:

- There are 194.6 million persons i.e. 15.2 % are hungry in India (FAO's report on State of Food Insecurity in the World 2015).

- India ranks 55th in the World Food Hunger Index where it is behind Nepal and Bangladesh (2014 GHI).
- There is news of starvation deaths & farmers' suicides from many states.
- 38.4% of children under age three are stunted, that is too short for their age and 46% are underweight that is too thin for their age (NHFS 2005).
- 33% of married women and 28% of men are too thin, according to the body mass index (BMI), an indicator derived from height and weight measurements.
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- India ranks 55th in the World Food Hunger Index where it is behind Nepal and Bangladesh (2014 GHI).
- There is news of starvation deaths & farmers' suicides from many states.
- Underweight is most common among the poor, the rural population, adults who have no education and scheduled castes and scheduled tribes (NFHS 2005).
- India is still plagued by droughts, famines and floods which adversely affects food production.
- As per The Global Food Security Index released by the American chemical company DuPont that considers the key issues of affordability, availability, and quality across a set of 105 countries, in the 2013 Index India has been ranked 71 in the list of 105 countries – much lower than neighboring China (ranked 42) and even lower than the 66th rank obtained the previous year.
- According to the United Nations, malnutrition is more common in India than in sub-Saharan Africa.
- UNICEF estimates that in India, one in every three children is malnourished, and nearly half of all childhood deaths are attributed to malnutrition.
- UNICEF studies reveal maximum under-nutrition in the five Indian states: Uttar Pradesh, Madhya Pradesh, Bihar, Rajasthan, and Orissa.
- India ranks below several countries in sub-Saharan Africa, such as Cameroon, Kenya and Nigeria in GHI, even though per capita income in these Sub-Saharan African countries is much lower than in India.

- When looking at child malnutrition specifically, India ranks 117 among 119 countries (Braun, Ruel, & Gulati, 2008, cited in Pathak & Singh, 2011).

In spite of the success of the Green Revolution, a huge bill for security is being incurred by the Central Government year after year. Total expenditure in food subsidies amounted to USD 12.4 billion, or around 1% of the national GDP in 2009 (Jha, Gaiha, Pandey, & Kaicker, 2013).

The benefits are not reaching the hungry poor and malnourished due to corruption, existence of middlemen and diversion of food grains to the open market. Even though there is an improvement in the lives of citizens after independence, the magnitude of improvement is not matching the funds spent, due to leakages in the funds because of corruption in the system. One can see real improvement only when corruption can be avoided or minimized in the delivery mechanism. The 'enemy' to be tackled is clearly identified, that is, the massive rates of leakage from the system, ascribable for the most part to illegal diversion of PDS commodities to the black market (Khera, 2011).. Different takes on leakage rates, as represented in the debate between Gulati and Saini (2015) and Dreze and Khera (2015), have caused fervent discussion not only regarding the different estimates of diversion, but also their policy implications. As a result, end-to-end computerisation of PDS is being considered a panacea for improvement, adopted with increasing faith by reforming states.

Recently three significant policy decisions have been taken by the the Government. The first is setting up of the Unique Identification Authority of India in The government has implemented the Unique Identification scheme whereby each citizen be it rich or poor has an electronic identity the Aadhaar card. Second was the passing of the National food Security Act 2013 in its endeavour to bring food security to all its citizens . It marks a paradigm shift in approach to food security – from a welfare based to rights based approach. Third is the Digital India programme launched on 1 July 2015 by Prime Minister Narendra Modi to ensure that Government services are made available to citizens electronically by improving online infrastructure and by increasing Internet connectivity. The initiative includes plans to connect rural areas with high-speed internet networks. The thrust of Digital India is the creation of digital infrastructure, delivering services digitally and Digital literacy.

The Government of India has also approved a programme by the name 'Digital India' on 20th August, 2014. Even though India is known as a powerhouse of software, the availability of electronic government services to citizens is still comparatively low.. The Digital India vision provides the intensified impetus for further momentum and progress for this initiative and to promote inclusive growth that covers electronic services, products, devices, manufacturing and job opportunities. India in the 21st Century needs to strive to meet the aspirations of its citizens where government and its services reach the doorsteps of citizens and contribute towards a long-lasting positive impact. The vision of Digital India aims to transform the country into a digitally empowered society and knowledge economy. The programme is proposed to be implemented in phases from 2014 till 2018. The Digital India is transformational in nature and is expected to ensure that Government services are available to citizens electronically. It would also bring in public accountability through mandated delivery of government's services electronically, a Unique ID and e-Pramaan based on authentic and standard based interoperable and integrated government applications and data basis.

1.1 Need for study

This research proposal focuses on the application of e- Governance in overcoming some of the key challenges of pilferage that India faces in ensuring food security to its citizens. This research proposal intends to study how the NFSA 2013 can be better implemented and monitored with the application and adoption of digital technologies . At the theoretical level, information and communication technologies (ICTs) are viewed as carriers of efficiency and accountability, so that e-governance has come to be seen as "the digital route to good governance" (Heeks, 2001). The use of new technologies enables removal of discretionary power from street-level bureaucrats (Bovens and Zouridis, 2002), resulting in higher transparency of administrative processes (Elbahnasawy, 2014): these considerations have been widely accepted in India, where the National e-government plan provides directives to improve governance through ICTs. The National e-Governance Plan approved in 2006 has made a steady progress through Mission Mode Projects and Core ICT Infrastructure, but greater thrust is required to ensure effective progress in electronics manufacturing and e-Governance in the country Recently, new technologies

have been highly used by Indian local governments, in order to improve their services to citizens (Bhatnagar, 2004; Kuriyan & Ray, 2009; Madon, 2009), optimize rural development mechanisms (Kaushik & Singh, 2004), and increase effectiveness of the social safety nets through which the country's poor are taken care of (Bussell, 2012; Pritchard, Rammohan, Sekher, Parasuraman, & Choithani, 2013). The theme of e-governance usage in social safety nets is to be observed, in contemporary India, with particular reference to the food security system, which is a central domain of the nation's anti-poverty strategy (Maseiro, 2014).

Given the leakage in the Public Distribution System, Indian states are being encouraged to computerise their PDS. However, it argues that computerisation needs to be coupled with deeper interventions to remove incentives for corruption. The Justice Wadhwa Committee Report for PDS (2011) divides computerisation into two parts: a first one to prevent diversion, and a second one to enable secure identification at ration shops. The Committee has recognised Chhattisgarh as a model state for the first component, and Gujarat as a model for the second. Other states have embarked upon the ambitious effort of computerising the whole supply chain, most notably Karnataka, where electronic PDS (e-PDS) covers transactions with authorised wholesale dealers and a biometric database of users. This research focuses on improving the PDS through computerisation and application of e-governance for implementation of the Public Distribution System..

Public Distribution System is a very important scheme for providing food security to the poor and needy. The success of this scheme like all other schemes however depends on proper targeting. Because of the huge subsidy involved and also because of the large number of fair price shops complaints of leakages and diversion are common. Monitoring of the scheme is difficult partly due to the insufficiency of staff and partly due to their complicity. Various innovative methods of reducing leakages and diversion have been tried in the country including bar-coded food coupons, food stamps, biometrically coded ration cards etc. None of these have been entirely successful. In the State of Chhattisgarh an end to end solution based in information technology has been developed and implemented with very encouraging results. Also propose to study the success of computerisation of paddy procurement in Chattisgarh , the Sugar Cane

Information system in Uttar Pradesh, ITC's e -Choupal and barcoding of Ration Cards in Gujarat which through the use of e-Governance has led to enhance food security and the transformation of rural India.

The Unique Identification number (Aadhaar) was conceived by the Indian government as a means for residents to clearly and uniquely verify their identity anywhere in the country. The mandate for the UIDAI includes defining the usage of the number across critical applications and services. The Public Distribution System is one such application, and the UIDAI has accordingly laid out the potential role Aadhaar can play within the PDS. The UIDAI recognizes that implementing the Right to Food is a priority today for the Indian government. The functioning of the PDS – the mainstay of India's food programs – is critical to the implementation of Right to Food in India, and is the focus of this note. The Aadhaar-linked mechanisms that are outlined here, can be akin to the Social Security number (SSN) being issued by the United States. This is a nine-digit number issued to U.S. citizens, permanent residents, and temporary (working) residents under section 205(c)(2) of the Social Security Act, codified as 42 U.S.C. § 405(c)(2). The number is issued to an individual by the Social Security Administration, an independent agency of the United States government. Although its primary purpose is to track individuals for Social Security purposes, the Social Security number has become a de facto national identification number for taxation and other purposes. This study makes an effort to study of how some States have improved the food security environment for its residents by application of e-Governance.. Also by making use of mobile platforms and improved connectivity the quick dissemination of information amongst various stakeholders can improve service delivery by leaps and bounds. However the four case studies undertaken reveal that some States like Gujarat, Karnataka, Kerela, Tamil Nadu and Madhya Pradesh which have made use of e-governance have done so on stand alone basis and there is little uniformity across the States. However PDS is monitored by the Union Government which decides how much and in what quantity and which foodgrains have to be disbursed to which target group. It has been recommended that in order to optimize on the IT infrastructure already set up by the Central Government by way of UID Authority and NIC and through Digital India a common MIS application which can also be adapted as an mobile App may be developed

for all States in the country with need based customization for each state. This will result in utilization of the use citizen database already available in digital through Aadhar cards can be used to disburse food rations to the poor thus reducing pilferage and improving accountal of food grains thus promoting transparency and reducing corruption.