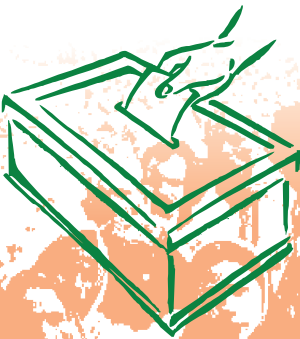




JOURNAL OF **GOVERNANCE & PUBLIC POLICY**

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INSTITUTE OF PUBLIC ENTERPRISE

ICSSR, MoE GOI RECOGNIZED CENTRE FOR EXCELLENCE IN RESEARCH

**Citizen's Charter for Improving Public
Service Delivery Through Accountability:
An Insight from the Field**

**Institutional and Organizational Factors
Influencing the Relationship
Between NGOs and Local Government in
Service Delivery: The Case of Kigamboni
Municipal Council in Tanzania**

**Hell or High Water? An Analysis of the
Murray-Darling Basin Water Plan**

**Financing Urban Infrastructure in India:
An Expedition**






**Moving from Incomplete Information to
Asymmetric Information: Cross Country
Analysis of COVID-19 Pandemic**

**The Road Not (To Be) Taken: An Assessment
of India's Ethanol Blending Program**

Aims and Scope

Journal of Governance & Public Policy is a bi-annual refereed journal published by the Institute of Public Enterprise to provide a forum for discussion and exchange of ideas on Governance (local to global) and Public Policy (including foreign policy and international relations) by policy makers, practitioners and academicians.

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From the Editors' Desk



The Journal of Governance and Public Policy has focuses on various dimensions of governance issues which range from COVID to Citizen Charters. The Journal with its multidisciplinary approach has ensured that the articles cover wide range of topics which are of interest to the readers and the researchers. The article, 'Citizen's Charter for Improving Public Service Delivery Through Accountability: An Insight from the Field' has brought out various issues pertaining to the execution of citizen charters and has highlighted the need for enhancing the overall effectiveness at the ground level. The article has highlighted the need for a citizen centric culture which is the need of the hour for the citizen charters to benefit the citizens.

The article, 'Institutional and Organizational Factors Influencing the Relationship between NGOs and Local Government in Service Delivery: The Case of Kigamboni Municipal Council in Tanzania' has highlighted the role and importance of NGOs and their relationship with the local government. The article has emphasized the need for enhancing collaboration between the local government and the NGOs so that that the benefits of such relationship accrue to the citizens.

The article, 'Hell or High Water? An Analysis of the Murray-Darling Basin Water Plan' has brought to fore the identification of the problems associated with Murray-Darling Basin Plan (Basin Plan) and also proposed the remedial policy intervention to address some of these problems.

The article, 'Financing Urban Infrastructure in India: An Expedition' has highlighted the need for better financing for the growth and development of urban infrastructure, given the rapid urbanization in India.

The article, 'Moving from Incomplete Information to Asymmetric Information: Cross Country Analysis of COVID-19 Pandemic' has brought out the issues pertaining to incomplete information and its asymmetric assimilation leading to the failure of markets and systems. The researchers have analyzed the data through multiple-regression analysis and concluded that taking adequate measures such as rapid testing, lockdown, quarantine facilities, hand-washing facilities, higher GDP per capita will reduce the morbidity rate.

The article, 'The Road Not (To Be) Taken: An Assessment of India's Ethanol Blending Program' has highlighted the benefits of blending ethanol with petrol which include, addressing India's energy security, developing local enterprise and reduction of vehicular emissions. However, the same is riddled with issues of biosafety and food security.

Given the diversity of the articles for the Journal, the readers will get good insights about the various issues of pertaining governance and public policy.

Geeta Potaraju
A Sridhar Raj

Citizen's Charter for Improving Public Service Delivery Through Accountability: An Insight from the Field

Pankaj Deep*

Abstract

In a democratic state, the political system is supposed to be accountable to its citizens to ensure better quality of governance and policy performance in terms of delivery of public goods and services for the citizens. The failure of accountability in respect to the performance of the state's apparatus results in poor governance. The lack of proper mechanism for accountability coupled with the absence of any ethical and moral compass on the part of the state apparatus is one of the main reasons of delivery deficit and accountability failure. Improving the quality of service delivery is a challenge, where the citizens often find it difficult to hold the government accountable precisely because they are unaware of the procedures and the norms, which govern the state service providers. India's initiative for an effective and responsible administration, arising out of the 1997 Chief Ministerial conference in the form of 'Citizen's Charter', emphasizes on the managerial route to establish a new pattern of relationship between the state and the citizens i.e., the state as the service provider and the citizens as the customers. Citizen's charter is a well-conceived document and road map with NPM philosophy to make administration citizen-centric, transparent, accountable, people-friendly and it has the potential to make service delivery efficient and effective. Here, in this study an attempt has been made to explore whether implementation of the citizen's charter in the state / locality has any role in improving public service delivery and ensuring accountability in policy performance. Has the citizen's charter empowered the citizens to hold the duty holders (state's functionaries) accountable? The above raised question has been answered through the field work evidence by focusing on five public services in Odisha. The paper concludes by emphasizing on the proper implementation of the citizen's charter that could address the problems of the people to overcome inefficiency and ineffectiveness in the delivery of public services, which can ensure the citizens' satisfaction as clients and establish accountability of the duty holder / state.

Keywords: Accountability, Citizen's Charter, Governance, Service Delivery

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Introduction

State, democracy and good governance are mutually related to each other. Delivery of various public goods and services is one of the basic responsibilities of the modern democratic state. Because of the impact of liberalization, privatisation and globalization introduced by liberal economic policy, the state is withdrawing itself from different sectors and that space is being taken over by the market (private / corporate sector). Despite this, some of the core services remain with the state because of their special nature and those are delivered to the citizens by the state.

Purchase of goods and services from the open market depends upon one's purchasing power (PPP)¹ of whether someone is capable to pay for the services available in the market or not. Majority of the India's population is not having adequate income and they do not have financial capability to fulfill their needs from the market. Therefore, delivery of basic public goods and services is the responsibility of the state, particularly for those who are in need of those services like the poor, low income households, and the socially marginalised people including the Scheduled Castes/ Scheduled Tribes. The extremely poor and low income segment of the population depends on the state to a larger extent for the provision of basic services including education, health care, livelihood support, and public distribution system (PDS). In the delivery of goods and services by the state, the executive branch of the government plays an important role and the bureaucrats are highly responsible for the execution of this function of the state. In actuality, the system is run by the bureaucrats and their role as the state's players in the context of governance and delivery of public goods and services takes centre stage (Afridi, 2017). The quality of governance and the performance of the public service delivery system have direct implications on the lives of the poor. Because of their poor economic condition, they cannot purchase the essential goods and services including education and health, required to survive, from the open market (ibid).

There are certain services which can only be delivered by the state to its citizens because of the special nature of such services. These include issuing caste certificates, social security assistance under national family benefit schemes, providing drinking water / tube well facility in the rural areas, various types of civil works for infrastructure development in the rural areas etc.

The citizen's charter, which came out of the Chief Ministerial conference in 1997, is a good initiative for administrative reform. It emphasizes on the managerial route to redefine the pattern of relationship between the state and the citizens and to introduce a new relationship i.e., state as the service provider and the citizens as the customers. This charter is a well-conceived document and road map following the philosophy of New

Public Management (NPM)² to make the administration citizen-centric, transparent, accountable and people-friendly, and it has the potential to make the service delivery efficient and effective. This new pattern of agreement and the relationship between the state and its citizens represent a paradigm shift in service delivery with a managerial model guided by the customers' needs and demands.

In this study, an attempt has been made to explore whether implementation of the citizen's charter in the state / locality has any role in improving the public service delivery and in ensuring accountability in policy performance. Has the citizen's charter empowered the citizens to hold the duty holders (state's functionaries) accountable? These issues have been explored through field work evidence by focusing on five public services in Odisha.

What is Wrong with the Governance? (The Poor Governance)

Good governance addresses mainly two things viz., the issues of efficient public service delivery system, and the methods or strategies, which render its effectiveness. The issue of efficiency in dealing with the problem areas and the strategies refer to the various techniques and methods used to address the problems (Vayunandan and Mathew, 2003). Its area of concern is to bring change at the macro and micro level. Macro level refers to the reform in the organisations of the public sector (structural reforms) to improve the performance of service delivery. It emphasizes on decentralisation of power and introduction of single window system for various services. Changes in micro level refer to the changes in the process and its management at the local level. David Shand (1998) argues that these ensure more effective implementation of the programmes through better targeting, more efficient operations and incentives to staff to improve the quality of the services and the service delivery system.

From the foregoing discussion it may be summarized that the main goals of good governance is to make the administration efficient to reach the people, make them feel good and ensure their well-being. The government must reach to the unreached and address their problems by satisfying their basic needs as clients. Citizens are not merely the passive recipients of services provided by the state. Rather they are the active participant citizens and their demands / grievances must be addressed through a grievance redress mechanism. The key elements of good governance are: transparency, participation, empowerment, accountability, equity, responsiveness among others. Poor implementation and ineffective policy outcomes are the cause of poor governance resulting due to the crisis of governance that adversely affect the citizens.

Governance and Accountability

New Public Management (NPM) suggests to make the administration more responsive and accountable. Accountability means responsibility for performance, quality of service and timeliness. It refers to be accountable for the results and to be answerable to the people as clients. It involves establishing responsibility for the non-fulfillment of objectives and to apply necessary corrective measures. Governance is the function of implementing policies and programmes in such a way that the objectives behind the policies and programmes could be achieved. It focuses on rising levels of accountability in the development process by identifying the claim-holders and their entitlements and corresponding duty-holders and their obligation. Mathur (2003) argues that accountability implies the existence of mechanisms that makes the public officials and political leaders (duty bearers) answerable for their actions and the use of public resources, which require transparency in the government process and free access of mass media in these areas of working of the government. It deals with how the bureaucrats and the other duty holders use their power and perform their duties, and for what and whom they are answerable to; how they are accountable for their action (Bhattachary, 2003). In this regard, the positive obligations of the duty-holders (to protect, promote and provide the necessary services), and also their negative obligations (to abstain from violations of rules) are taken into consideration. It also requires development of adequate laws, policies, institutions, administrative procedures and mechanisms for redress and accountability that can deliver on entitlements and respond to denial and violation of the necessary process. This calls for the translation of universal standards into locally determined benchmarks for measuring progress and enhancing accountability. Mukherji (2002) argues that accountability does not mean only procedural accountability; rather it ranges from negative to positive accountability. It includes result-oriented (outcomes) accountability, taking into consideration the accountability for the outcomes of the policies and for the people benefited. It focuses on efficiency and effectiveness of the service delivery mechanism of the government, which is one of the main areas of good governance and NPM. Institutional mechanism to maintain transparency and public scrutiny was established by the Right to Information Act 2005, which was considered as the master key for good governance (GoI, 2009: 2nd ARC). Further, the citizens' charter was also introduced to bring in effectiveness in the mechanism of transparency and accountability. It holds the state agencies, precisely the bureaucrats, accountable for the results (Ibid). Let's focus on the citizen's charter and its normative provisions for the improvement of the service delivery, and ensuring accountability.

The Citizen's Charter – Concept and Purpose

The citizen's charter is a new form of agreement that redefines the relationship between the state and its citizens and aims to make the citizens informed and empowered about their entitlements. Its emphasis is on the service provider's (state) responsiveness to the citizens as clients/customers in terms of the delivery of public services with greater efficiency, effectiveness and promptness (Nikos, 2001; Kundo, 2018; Haque, 2005). This new pattern of agreement and the relationship between the state and its citizens represent a paradigm shift in service delivery towards a managerial model in the line of NPM guided by the customers' needs and demands. Citizen's charter is a public document setting out standard of services to which the citizens / customers are entitled. It is a consumerist approach to public services (Nikos, 2001; Haque, 2005). Citizen's charter is perceived as a legal instrument, which could be used to chisel out the possibilities of a healthier relationship between the service provider (state) and the users i.e., the citizens as the clients / customers. Citizen's Charter has its British origin as introduced by Prime Minister John Major in the form of a white paper on 'The Citizen's Charter' in 1991. The key objectives of this were to improve the quality of public services and make the service provider accountable to the citizens for its performance. The charter initiative embraced greater accountability, transparency, scrutiny of public services and change in the process of management to improve public services (Lewis, 1993). The United Kingdom model of the charter has been adopted in various countries including India, by different names.

India introduced the citizen's charter followed by the Conference of the Chief Ministers in May 1997. This was in response to the changing demands and expectations of an increasingly aware population for a more responsive and responsible public service delivery system (Sharma and Agnihotri 2001). To address the concerns of the citizens regarding their problems and to ensure a responsive, accountable, transparent, simple, citizen-friendly and citizen-centric administrative system, and with the objective to re-establish peoples' faith on the system (government) against the prevailing citizens' dissatisfaction, insensitivity and irresponsiveness of the system, the then Indian Prime Minister had inaugurated a conference of the Chief Secretaries in 1996. It was also aimed to make the public service delivery system efficient and effective. The outcomes of the conference suggested various corrective steps for the reform of the administrative system, which was popularly known as the civil services reform. The recommendations were as follows: accountability in tune with citizen's satisfaction, responsive delivery of public services and introduction of citizen's charter and so on.

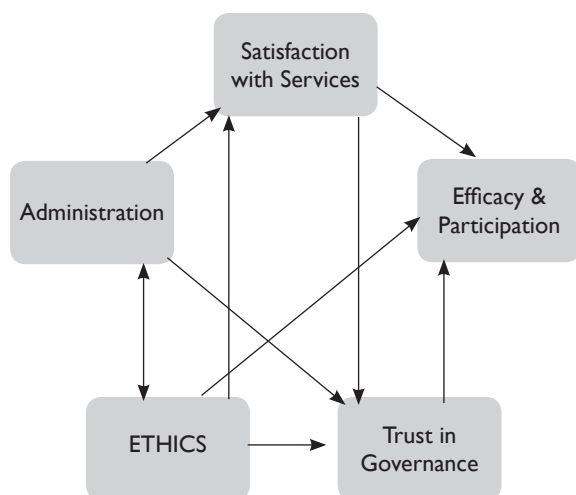
The Department of Administrative Reforms and Public Grievances (hereafter cited as DARPG) defines and outlines the main components of the citizen's charter for each government organisation both at the central as well as state levels. Citizen's charter is an instrument which seeks to make an organization citizen-friendly, transparent and accountable. It is basically a set of commitments made by an organization regarding the standard of service, which it delivers to the citizens (GoI, 2009). Citizen's charter is clearly the codified expectations and standards in the realm of service delivery, a dedicated grievance redress mechanism, effective citizen relations strategy to increase users' knowledge / awareness about the services provided. The citizen's charter of every organization is supposed to present several essential components, including the statement of vision and mission of the organization, to make it effective and meaningful. This in return helps in holding the service provider/organization accountable. Details of its services, business transactions, service quality, norms, procedure to access the service provider, the redress mechanism etc. are to be clearly mentioned. It helps the users to understand the types of services they can expect from a particular service provider (GoI, 2009; GoI, 2004). The Second Administrative Reform Commission (hereafter cited as SARC) in its fourth Report titled 'Ethics in Governance' has observed that in order to make the charter an effective tool for holding the public servants accountable, it is needed to clearly spell out the remedy/penalty / compensation in case there is a default in meeting the standard mentioned in the charter (GoI, 2009:45). The second ARC goes further and suggested for making administration more citizen-centric. In this regard the citizen's charter is not an end in itself; rather it is a means to an end. It is an instrument to ensure that the citizen is always at the centre of any service delivery system (ibid: 53). The SARC recommended (in chapter fourth, recommendation 4.9.9) a seven step model for a citizen-centric administration. It asked both the central and the state governments to make the seven step model mandatory for all their organizations having public interface. These are as follows:

- Define all services which are provided and identify the clients.
- Set standard of norms for each service.
- Develop capability to meet the standard.
- Perform to achieve the standard.
- Monitor performance against the set standard.
- Evaluate the impact through an independent mechanism.
- Improve continuously on the basis of monitoring and evaluation (GoI 2009: 54-57).

(In short it is known as DSDPMEC model)

The fundamental principle in a democracy is that all the functionaries of the state hold their authority on behalf of the people and the people are the source from where the authority is derived. Put in differently, all the functionaries of the state are the trustees of the people. With the expansion of the role of the government in a modern welfare democratic political system like India, the public functionaries exercise considerable influence over the lives of the people in general and the poor and the marginalized people in particular. The trusteeship relationship between the public and the state's functionaries requires that the authority entrusted to the agency (officials) be exercised in the best interest of the people or in common 'public interest' (GoI, 2007: Ethics in Governance). The authority must follow the ethics of public good. The relationship between ethics and administration has been shown diagrammatically in Figure-1.

Figure-1: Relationship Among Agency's Ethics, Administration, Citizens' Satisfaction, Governance and Its Efficacy: A Model



Source: Author's assimilation, originally extracted from (Vigoda Gadot, 2006:290).

Public Service Delivery System in India

Generally, public service means the goods and services, which are provided by the public institutions to its public i.e., the citizens, which have codified provisions for it. For instance, provisions and delivery of services like education, health, employment through MGNREGA, PDS etc. come under this, which aim for the well-being of the people. The provisions are laid down and the management and operation of the public services are performed by the public institution, the state, and it has a co-relationship with the lives of the people. If the public institutions run well and deliver public goods and services in an efficient and effective manner, then it would help to improve

the governance of the country and make the people active participants in the process of the country's growth and development. Any malfunctioning in the process and the system has adverse affects in the lives of the poor. Better functioning of the public services can make a big difference in the lives of its citizens in general and the economically weaker sections of the population in particular as they are dependent on the state's services (Dreze and Sen, 2014). So the pertinent question is: how can the accountability of the public institutions be developed and strengthened? How can the public institutions deliver their best in terms of serving the interests/demands of the public? These are some of the matters of public concern. Research in the areas of policy implementation have found that the state is not doing well or it has failed to effectively deliver public services, particularly to the poor (Dreze and Sen 2014; Dreze and Khera, 2015; Afridi and Iversen, 2014).

The impact and performance of any policy depend upon a great extent on how well they are being implemented. The strategies of implementation are crucial to the success of a policy (Mathur, 2003). In this regard, Dantwala (1978)³ has suggested in his report, 'The mechanics of implementation is even more important than the mechanics of plan formulation. However good a plan may be, its impact will depend entirely on how well it is implemented' (GoI, 1978; quoted in Tiwari, 1990:9).⁴ To give justification to his arguments he further stated, 'While formulation of a good plan demands comprehension and technical competence on the part of a few men at the top, implementation encompasses a vast number of state's functionaries and agencies in a vast varieties of fields and demands qualities on their part...' (ibid:9). In a similar manner, the implementation of the citizen's charter and its outcomes depend on the agencies involved in the process of implementation. The task of implementation remains primarily in the hands of the bureaucrats. In fact, the entire delivery of public services depends on the performance of the civil servants. Therefore, 'the civil servant must change its present attitude of aggrandizement, arrogance and aloofness, and become really civil in its dealing with the citizens and service to the society. It must inculcate fanatic integrity and administrative ethics in work and behavior. In short, it must consciously set out to professionalize and human itself' (Arora, 2006: 279).

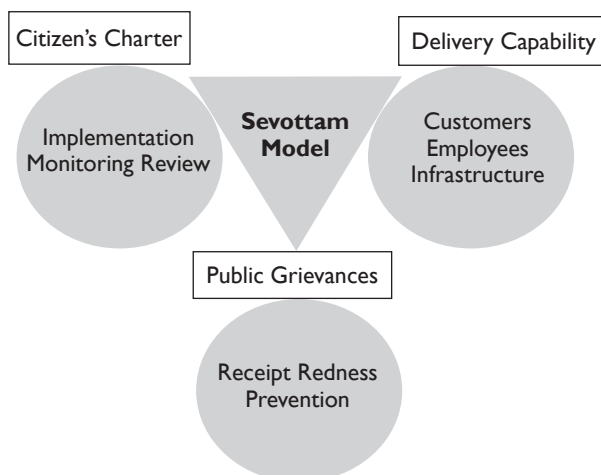
Let us have a close look at a useful model, like the SEVOTTAM model, for improving the public service delivery system in India.

Useful Model for Improving Public Service Delivery System – The Sevottam Model

This sub-section deals with the provision of SEVOTTAM model for effective delivery of public services, which aims to make the citizens

empowered and hold the service providers accountable for the policy outcomes.

Figure-2: Sevottam Model



Source: Author's assimilation, originally extracted from (Gol, (2009), SARC and Ramakrishnan, R. (2013)).

The Second Administrative Reform Commission in its 12th report titled 'Citizen-Centric Administration – The Heart of Governance' has recommended for making the administration more transparent, responsive, accountable and citizen-friendly with the prescription of a 'seven step model of citizen centricity,' which is mandatory to be adopted by all the government organisations (GoI, 2011). This model is known as Sevottam model, prepared and documented by the Department of Administrative Reforms and Public Grievances, Government of India. Sevottam is a combination of two Hindi words i.e., *Uttam* – means best and *Seva*- means services, there by meaning *uttam seva* / excellence in service delivery (ibid). It is backed by an Indian standard IS 15700:2005, which was specially created for measuring and certifying quality of service delivery by public service organizations (ibid: 7).

The model has mainly three components, namely (1) Citizen's Charter (2) The Public Grievance Redress and (3) Delivery Capability – Capability Building for Excellence in Service Delivery. The QMS Sevottam framework provides the answer through above mentioned three modules, which helps to identify gaps in service delivery. The criteria are articulated in the form of questions that can invite rating on a five point scale ranging from 'ad hoc to systematic action (1 to 5). The process of quality assessment is done on the basis of a rating mechanism to assess the quality of tool application

and its utilization to improve service delivery. It consists of eleven criteria for each of the three modules. Thereby, it altogether consists of thirty three ($3 \times 11 = 33$) criteria (ibid).

Detail of the three components and 33 criteria are as follows:

Citizen's Charter

By defining the services to be provided to the citizens, and the mechanisms for citizen's inputs, it declares the information on the citizen's entitlements, which makes the citizens informed and hence empower them to demand better services. This will be achieved through the eleven tasks mentioned below:

Implementation

- Identification of services offered and their standard.
- Understanding expectations of the service recipients.
- Aligning services offered with expectations of the service recipients.
- Preparation of citizen's charter.
- Understanding the contents of the Charter (GoI, 2011; Ramakrishnan, 2013)

Monitoring

- Comparison of the actual with the prescribed standards.
- Communication about differences in the actual and the prescribed standards.
- Elimination of differences between the actual and the prescribed standards.

Review

- Charter effectiveness assessment.
- Aligning of the charter with changes in the environment.
- Awareness about revision in the service standards and the charter. (ibid).

Public Grievance Redress

This deals with the remedies available to the citizens with reference to the services provided by the government, problems and any disputes that arise in this context. This will be achieved through the below mentioned eleven tasks:

Receipt

- Public Awareness of the grievance lodging process.
- Convenience for the public in lodging grievances.
- Classification of grievances at the point of receipt. (ibid).

Redress

- Determination of time norms for grievance handling.
- Adherence to time norms for grievance handling.
- Disposal of grievances. (ibid).

Prevention

- Identification of grievance prone areas.
- Action on grievance prone areas through annual action plan.
- Action on grievance prone areas through charter review.
- Action on grievance prone areas through internal coordination.
- Awareness about progress of controlling grievance prone areas. (Ibid).

Delivery Capability

This deals with the capability Building for Excellence in Service Delivery. It postulates that an organization can have an excellent performance in service delivery only if it is managing the key ingredients for good service delivery well, and building its own capacity to continuously improve delivery. This will be achieved through the below mentioned eleven tasks:

Customers

- Determining and improving the citizens' satisfaction levels.
- Measuring citizens' satisfaction levels across the organization and field offices.
- Using citizens' satisfaction measurement for review of the charter.
- Creating a citizen-focused environment across the field offices.
- Differences in service delivery performance across the field offices. (ibid).

Employees

- Employees' behavior for courtesy, punctuality, promptness of delivery.
- Willingness of employees to accept responsibility.

Infrastructure

- Basic Infrastructure and facilities for service recipient.
- Resource requirement to meet prescribed service standard.
- Efficient use of available resources for continuous improvement (ibid).

All the thirty three points of the foregoing discussion could be broadly clubbed in seven steps as follows: (a) Define (b) Set (c) Develop (d) Perform (e) Monitor (f) Evaluate, and (g) Continuously Improve (GoI 2009). In short form it is known as the DSDPMEC model.

The following sections deal with the implementation of the foregoing discussed theoretical model and evaluate the effect of the citizen's charter to know how it has an impact in improving service delivery in Odisha.

Methodology

This article is based on field work, qualitative research and desk research. In this article it is examined how the citizen's charter has been implemented in Saintala Block / Tahasil of the district of Balangir in particular, and in Odisha in general, and how it ensures accountability in delivery of public services. The primary objective of the paper is to examine the provisions of the citizen's charter and its effectiveness in terms of improving the public service delivery system, transparency in the governance mechanism and ensuring accountability of the duty holders. This paper is basically based on an empirical study. Field work was conducted after examining the secondary sources for the study. Five services from three different departments were chosen for the investigation. Both descriptive and analytical methods have been adopted while studying the issues. As part of the field survey, interviews of the service users, concerned citizens, general public, stakeholders, and officials in the Block / Tahasil have been undertaken. Focus group discussions were also organized in the field to gather information.

Implementation of the Citizen's Charter: A Field View

To know the reality of the implementation of the citizen's charter and to examine its benefits in the context of improving the public service delivery and ensuring accountability of the duty holders in Odisha, five public services from three different departments were chosen out of the total 370 services of the 30 different departments of the government of Odisha. These services have been notified by the Government of Odisha as per the provisions of Odisha Right to Public Services Act, 2012, on 3rd June 2020 (GOO, 2020). The five time-bound public services, which were selected for the study, are as follows: (1) disposal of application for the issuing of Scheduled Caste Certificate, (2) disposal of application for issuing of Scheduled Tribe Certificate, (3) assistance under national family benefit scheme, (4) finalization of work bill, and (5) repair of hand pump / tube well. The details in this regard are given in Table-1.

In the field, it is observed that there is a big gap between the norms in the citizen's charter, and its implementation and performance. The findings in the field in terms of effectiveness of the charter have been analysed under the following heads: Effectiveness of the charter in terms of empowering the citizens, awareness among the citizens / service recipients about the charter, normative provisions of the charter and service delivery status, accountability and monitoring mechanism, and complaints receiving mechanism and their resolution.

Table-I: Time Bound Different Public Services (Under Right to Public Services Act, 2012)

| S N | Name of Public Service | Name of Department | Given time Limit (Days) | Designated Officer | Appellate Authority | Revisional Authority |
|----------------|--|---|--|---------------------------------|--------------------------------|---------------------------------|
| 1 | Disposal of application for issuing of Scheduled Caste Certificate | Revenue & Disaster Management | 30 | Tahasildar/ Addl. Tahasildar | Collector | RDC |
| 2 | Disposal of application for issuing of Scheduled Tribe Certificate | Revenue & Disaster Management | 30 | Tahasildar/ Addl. Tahasildar | Collector | RDC |
| 3 | Assistance under National Family Benefit Scheme (NFBS) Rural areas | Social Security and Empowerment of Person with Disabilities | 30 | BDO | Sub-Collector | Collector |
| 4 | Finalization of work bill | Panchayati Raj and Drinking water | 30 | BDO | PD, DRDA (31-90 days) | Collector (61-90 days) |
| 5 | Repair of hand pump/ tube well | Panchayati Raj and Drinking water | 7 | Junior Engineer- II, RWSS | Assistant Engineer, RWSS | BDO |

Source: Government of Odisha (GOO), 2020. Government of Odisha General Administration and Public Grievance (AR) Department, Notification No. 12974 GAD-AR-ORPJ-0003-2016/AR, Dated 3rd June.

Effectiveness of the Charter in Terms of Empowering the Citizens

The charter could not empower the citizens as the service users / clients, which was anticipated by the policy makers. The vision to make the administration citizen centric and reaching to the citizens has not been translated into reality because of the attitude of the state functionaries and the negative perceptions they have. They do not pay required attention to the charter to fulfill the intended objectives. Further, it is being taken just as an official ritual just because of the directives given by the higher authority. Even the organizations have not paid attention on its achievement as there is no exercise of periodic review on its achievement by the higher authority. The present administrative culture in the state is highly elitist by nature and the bureaucrats maintain distance from the people, which is putting barriers against the general public to reach out to the public offices and raise questions and hold the duty holders accountable for the non-performance/ poor performance of the service delivery system. Furthermore, there is no such institutional mechanism where the citizens can raise direct questions to the officials. Although the RTI Act is there to get information, but it is not serving the purpose. In addition to that, most of the respondents (85%) said that they always try to get their services by different means like by (to

be removed) taking the help of the middle men, through the advocates etc. rather confronting the officials or lodging complaints against them with the higher authority. It is happening because of many-fold reasons including fear, unawareness about the charter, not being aware of the complaint mechanism, ignorance and illiteracy. Hence, the charter has just become a showpiece document instead of empowering the citizens.

It is observed that there is a need of (for) a strong organizational commitment to make the charter a citizen-centric programme, which can be able to improve the service delivery. In addition to that a responsive and friendly attitude of the service providers towards the service users is needed.

Awareness Among the Citizens / Service Users About the Charter

Field evidence reveals that the citizens have little awareness about the charter. Among the respondents, 86 per cent are unaware about the charter and only 14 per cent of the respondents answered affirmatively of being aware about it. Some of them responded that they just heard of it and only few of them (5%) were familiar with the charter. There is a direct link between the awareness among the citizens about the charter and reaping the benefits out of it. Unawareness among the citizens shows that the charter has not been effectively implemented in the locality. Empirical evidence reveals that even the organizations are yet to have proper websites, which would show the list of the state functionaries/service providers and their assigned responsibilities. Even the offices (Block / Tahasil) have not displayed the boards related to the information on the charter, list of services, name of the service providers (state functionaries), their phone numbers etc. It is known from the observations that there is very little awareness about the charter among the state functionaries too. The state/organization did not make any successful effort towards the training of the service providers / staff in this regard. The state did not organize any programme for the publicity of the charter and to make the citizens aware about it. The author did not find any information about any facilitation counter for getting information regarding various services offered and its procedures by the organizations / offices in the field.

Normative Provisions of the Charter and Service Delivery Status

Under the Right to Public Services Act 2012, various services are clearly mentioned with the maximum time limit for getting each service. However, field observation reveals that execution of the charter has not improved service delivery substantially and there is no such visible

difference between the pre-execution status and post-execution status of the charter in terms of improving the service delivery. It is beyond doubt that because of the introduction of information technology (IT) in the state administration in due course of time, the administration has brought some changes in its operation including some improvement in the service delivery. In the initial period it was anticipated that the charter would bring a paradigm shift in the field of service delivery, which will address the growing concern regarding the quality of the services, timely delivery of the services, customer satisfaction etc. These are yet to be achieved by the state in the area of study. The textual provisions of the charter have not been translated into reality in the locality. During the time of field work, the service recipients shared their experiences to the author regarding the quality of the services and the time taken in getting each service. When the author posed the question regarding satisfaction of receiving the service in case of getting certificate of belonging to SC/ST from the Tahasil office, majority of the respondents (84%) expressed their grave dissatisfaction on the service delivery performance of the service providers and only 16% of them said that they are somehow satisfied with it. The respondents revealed that it is almost impossible to obtain a caste certificate from the Tahasil office within the specified 30 days time limit without taking the help of the middlemen like the advocates, stamp venders, lower level staff of the office or other touts by paying money to some of them. Those who are educated or belong to the elite class, or have access to social capital, or those who can spend money (through the middlemen) get easy access to the government system and they are getting the necessary services easily within the time limit. But in case of the illiterates, the poor and the general public, it is not possible to get the service easily. This has many adverse impacts on their lives. For official work they have to run to the offices for several days and also they are subjected to harassment by the officials.

Under the 5T programme, the government of Odisha introduced Mo Seva Kendra, along with an online service portal, aimed to deliver government services at the doorsteps of the citizens. So far the portal is concerned, the poor illiterate people cannot have access to such technical facilities, Majority of the respondents (52%) expressed their dissatisfaction on this process as they feel inconvenience to the system and they said that the off-line mode was easy for them. The reasons for their dissatisfaction are as follows: online mode somehow creates huddles for them as they are illiterate and they do not have access to computers and internet and also they do not know the know-how of using such technology and they cannot use the portal themselves. On the other hand, the Mo Seva Kendra charges more money, and the officials make mistakes in filling up the online forms in relation to name, address etc. These centres are usually overburdened

with work and the officials do not pay proper attention to the customers. However, the online mode makes the process easier for the educated people who have access to computers and internet for getting the required services. It also helps to maintain transparency in the process where the application / file can be easily traced.

In case of the National Family Benefit Scheme, only 10% of the respondents responded that they got the service within the time limit. So far as finalization of work bill is concerned, there was mixed responses. 25% responded that they got the final bills of the work cleared within the specified time limit and rest of them expressed their dissatisfaction in getting the service. Even few of them (15%) said that getting the final work bill approved was a tough task and a lot of patience is required to get it. As it is known from the field, sometimes the officials harass the beneficiaries and they deliberately delay the work on their files. In the cases of small repairing of the hand pumps / tube wells, the responses were positive and majority of the respondents were happy about it. However, in case of major repairing, sometimes it took more than the specified time and more follow-ups were required.

The supply side said that there is a shortage of skilled manpower and human resources, and there is burden of work in the Block / Tahsil office, and no proper in-service professional training was given to the subordinate staff as well as the officers for skill enhancement to tackle the problems.

Accountability and Monitoring Mechanism

There is a normative provision in the Odisha Right to Public Service Act 2012 to impose penalty on officers / duty holders for their non performance (GOO, 2012). However, field observations reveal that most part of the provisions could not be translated into practice. The state functionaries are no way accountable to the citizens for their performance. Never any penalty has been imposed on the officials for their non performance by the higher authority in the study region. They are only answerable to their higher level authority in the bureaucratic hierarchy and not to the citizens. Furthermore, no mechanism exists where the citizens can hold the officials accountable or pose questions for non performance.

The citizens / service users are supposed to be informed about the policies of the government and the procedures to obtain its services. Field observations found that it is not happening in this manner in the field. According to the provisions of the right to public serve act, there is a mechanism for the central monitoring system (online mode) to make the service more effective to address the problems of the citizens. However, this requires access to computers and internet, and the knowledge and skill of using them. The illiterate mass could not use it. Even they are unaware of

it. Study found that the charter is not effective in the field as was expected because of its improper implementation.

Grievance Redress Mechanism

There is a provision in the charter for the citizens to lodge complaint regarding their dissatisfactions if the services fail to meet their expectations, against the response / attitude of the service providers. They can also provide important feedback for efficiency and effectiveness of the service delivery. Aim of the public grievance redress mechanism is to resolve the grievances of the citizens in an effective and time bound manner (GoI, 2011). So far receiving of grievances and its resolution in the studied region / Odisha is concerned, the government has made provisions for receiving complaints from the citizens through Mo Sarkar, and Odisha State Grievance Redressal Portal in addition to the provision of receiving complaints in each office through the complaint drop boxes or by lodging complaints by meeting the concerned officer directly. There is also a provision of appeal in the hierarchical line.

However, during the field work it was noticed that majority of the respondents (95%) never complained about their dissatisfaction of the services that they had experienced and only 5% said that they made (remove) complained about their dissatisfaction, but it could not be solved. For them the reasons are unknown. It is revealed from the focus group discussions with the service users that most of them are not in a mood to complain against the service providers; rather they just try in getting the services. It is also known from the discussions that the service users were afraid of the state functionaries and that prevented them from lodging any complaint against them. Majority of the respondents (86%) are unaware about the complaint mechanism, 5% knew about the existence of the online complaint mechanism, but they are unable to access the computer / internet etc. Field evidence revealed that the administration / officers are not people-friendly; the system is not user-friendly, the officials did not try to reach out to the people and they do not take these issues on a priority basis. Furthermore, due to the prevalence of the elitist attitude of the officials, the administration is keeping itself away from the people. Although the charter has enabled the citizens to lodge complaints against the state functionaries in case of dissatisfaction, but in reality it is not happening so in the studied region. Even if there is a wide malfunction of the service delivery, very negligible number of complaints was lodged in this regard.

Conclusion

Introduction of the citizen's charter is a good initiative to make the administration citizen centric, responsive and accountable to improve

service delivery and create trust of the citizens on public institutions. However, the field evidence concluded that it could not achieve its objectives as it was anticipated in the initial period of its implementation. This happened so because of the improper execution of the charter. Undoubtedly the charter is well designed, but only a well designed policy will not automatically perform and get its set results. The charter has to be implemented in its letter and spirit, which was not seen in the field.

Despite the official policy pronouncements and reform initiatives by the government, the citizens' dissatisfaction with public action continues to grow. The tangible benefits of the charter have not always been evident for the ordinary citizens, especially those from the poor economic background, the illiterate and the marginalized sections of the society. To achieve the goals, there is a need of creating a favorable atmosphere where there will be awareness of the citizens, the people will be literate and knowledgeable about the process/system, and the citizens will be capable to hold the service providers accountable. At the same time, it must be ensured that there prevails a friendly administrative culture where the citizens have a space in the administration. The service providers should have the working culture with commitment for timely performance of the assigned tasks of the organization as well as they must ensure citizens' satisfaction for the vision of the charter to be successful.

Empirical evidence reveals that these pre-conditions to achieve the objectives of the citizen's charter have been missing in the study block/ Tahasil in Odisha. The government did not undertake any such programme to create awareness among the citizens about the charter, which could have generated demands from the citizens, and they would have raised their voices against the officials for nonperformance. It just remained as a top-down approach with making the citizens passive recipients without improving the service delivery. Retrenchment in government employment has not necessarily generated efficiency or changed the way that officials interact with the citizens. Rather it made the charter to have a limited impact. While there is some improvement in the service delivery mechanism with the introduction of the citizen's charter, still we are far away from achieving the set objectives as anticipated. Even many of the government organizations have not updated their official websites for years together by now. They are not disclosing the basic information, which could help the service seekers. A study by IIPA on the citizen charter found that the real implementation of the charter is in question and even many central ministries have not adopted the charter yet. For some public organizations/ ministries, it is merely a ritual exercise. (IIPA, (Arora): 2008). 'Any effort

to transform the Indian administrative system would require high level of political strength and will power. Out failure at reform in administration and to improve public service delivery system lies in the lack of political will. Lack of political will is one of the core problems' (Mathur, 2000:117).

Despite the above mentioned shortcomings, the public services delivery system in Odisha has performed its duty to some degree to provide the basic services to the citizens. It cannot be called as a total failure. The efforts and initiatives are visible, but it is not up to the level of expectation and not entirely according to the vision of the citizen's charter. The performance would have been better if the citizen's charter would have been implemented effectively. It is absolutely necessary that the citizen's charter should be implemented properly to realize its set objectives and to improve the public service delivery in a state like Odisha.

Endnotes

- 1 Purchasing power parity.
- 2 NPM is based on two basic principles, namely. (i) Managerialism, that is introducing methods of private sector management to the public sector which includes hands-on professional management measurement of performance by results closeness to clients, and (ii) new institutional economics. It refers to introducing incentive structure (such as Perks of remuneration etc.), greater competition etc. In fact NPM gives emphasis on rowing than steering. Rowing here means the governance (service delivery), and steering implies policy decisions. Philosophy of NPM is entrepreneurial government based on the principles of focusing on output, measure of performance of their agency, stick to goals not to procedure, clients as customers and offer the choice, decentralize authority, participatory management, autonomy to the operating agencies and individuals etc. to make the government mechanism and it's services more efficient, effective and economic. See D. Osborne and Ted Gaebler (1992). *Reinventing Government*, New Delhi: Prentice Hall of India.; C.Pollitt (1993). *Managerialism and the Services* (Second edition), Oxford: Blackwell; R.A.W. Rhodes (1996). 'The New Governance: Governing without Government.' *Political Studies*, vol. XLIV, (4), pp: 652-67.
- 3 Prof. M.L. Dantwala was the chairman of the Working Group on Block Level Planning, Constituted by the Planning Commission, GoI and Report was submitted in 1978.
- 4 Quoted in R.K. Tiwari (1990). *Rural Employment Programmes in India: The Implementation Process*, New Delhi: Indian Institute of Public Administration.

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Institutional and Organisational Factors Influencing the Relationship Between Non-Government Organisations (NGOs) and Local Government Authorities (LGAs) in Service Delivery: The Case of Kigamboni District Council in Tanzania

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Abstract

The growing problem of scarcity of resources particularly in developing countries and the demand for services by citizens has escalated the need for collaboration between NGOs and local governments to address this service gap left by local governments. Nevertheless, the collaboration between NGOs and local governments is engulfed by the constraints emanating from organisational and institutional contexts. Although some of these organisational and institutional constraints have been disclosed by the literature, overall the research which studies the combination of these constraints and the way they influence collaboration between the government and NGOs is scarce. This paper explored the relationship between NGOs and LGAs in service delivery in Tanzania and the way these constraints influence their relationship. The findings of the study show that both formal and informal institutions including the attitudes and perception of the officials from both sides severely constrain the relationship between the two actors in service delivery and recommend the use of seminars, meetings and workshop as an instrument to improve collaboration.

Keywords: Collaboration, LGAs, NGOs, Service Delivery, Tanzania

Introduction

The anecdotal evidence shows that the scarcity of resources: both financial and human resources constrain the governments to provide adequate public services to their citizens. The scarcity of resources and the growing demand of services have fuelled the need for cooperation between governments and

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NGOs in service delivery. Apart from that, engagement of NGOs in service delivery by governments has become more necessary not only because the NGOs carry some obligation to improve social welfare but also because NGOs operate in local areas and can easily recognise the needs of the local community (Botha 2018; Wallevik and Schanke 2006). Nevertheless, the mainstream literature shows that the relationship between the government and NGOs in many countries is tense. The two sides do not communicate about their needs and expectations. This makes it difficult to get in the way of a smooth and mutually supportive working relationship (AKDN 2008). Partially, the problem of poor communication is caused by the existing institutional framework which does not provide an enabling environment for the growth and effective functioning of NGO sector. Other factors include; lack of trust between both parties which is attributed by lack of willingness of government to appreciate the contribution of NGOs in public service delivery. Another factor is poor coordination and self-interest among the NGOs themselves.

In order to guide the operation of NGOs in Tanzania, the government established NGOs policy in the year 2000 to allow NGOs to take part more efficiently and effectively in social service delivery. The goal of the policy was to provide favourable conditions for the operation of NGOs in service delivery. Despite the presence of the policy, the cooperation between governments and the NGOs is still thorny (Kukkamaa 2008). Apart from that, some NGOs are denied of subsidies from the governments (RAAN 2013). As a consequence, most of the NGOs operating at the local government level find it difficult to build a partnership with the local governments (AKDN 2008; Botha 2018). The question is what goes wrong? How can we explain the factors impeding the relationship between NGOs and Local Government in service delivery? How do NGOs cooperate with LGAs in public service delivery in Tanzania? What are the factors which can explain the effective collaboration of the two actors in service delivery? The remaining part of this article answers these questions. It first begins with the concept of NGOs and the analytical framework, the methodology and then the findings which are organised in three sections and finally conclusions and recommendations.

The Concept of NGOs

The concept of NGOs has been defined differently. For some authors, it implies non-profit, philanthropic organisations; for others, particularly in South Asia, it carries a more negative implication of high salary, donor funded organisations (Bano 2008) while for others like World Bank it implies the private organisations that pursue activities to relieve suffering, promote the interests of the poor, protect the environment, provide basic social services, or undertake community development (World Bank 1994).

In general, NGOs can be defined as organizations that are not part of the government, and yet are set up for public benefit and are established in the communities as part of the civil society to facilitate development and respond to the needs of communities (Nkosi 2015; Siziba 2014). In Tanzania, the Tanzanian NGOs Act of 2002 defines it as a voluntary grouping of individuals or organisation which is autonomous, non-partisan, non-profit sharing organised at a local, national or international level, for purposes of enhancing or promoting economic, environmental, social or cultural development or protecting the environment, lobbying or advocating on such issue; or established under the auspices of any religious or faith propagating organisation, trade union, sports club, or community-based organisation but does not include a trade union, social club, sports club, political party, religious or faith propagating organisation or community-based organisation (URT 2002). In this article, I will use this definition because I am especially interested on how structure, autonomy and resources of the NGOs are disposed of and their effects on cooperation between NGOs and local government in service delivery.

Analytical Frame

This paper uses organisational science and institutional theories to explain the typology of factors which moderate the relationship between the government and NGOs in service delivery. The theory shows that organisations are a product of institutions but also institutions can influence the performance of the organisations. Formal institutions set rules, policies and laws which actors have to conform with while social institutions provides social rules and norms which govern the behaviour of the actors and the organisation. Organisations evolve successfully if they can adapt their forms, practices and identity into this requirement (Greve & Argote 2015; Lameck 2017; Rodrigues & Child 2008). Institutions provide constrains and opportunities for the actors to advance their interests but also the actors can interpret, manipulate or change the constraints and opportunities (Greenwood & Hinings 2006; Lameck 2017). This means that institutions set boundaries of behaviour between what is allowed or not allowed in a particular context (Meyer and Rowan 1977; Powell and DiMaggio 1991). If organisations incorporate institutional rules within their own structures, organisations become more homogeneous and more similar in structure over time (Brinkerhoff & Brinkerhoff 2002; DiMaggio & Powell 1991; Scott 1998).

Therefore, organisations evolve by adapting to prevailing systems, converging on established successful models, positioning themselves as far as possible at the centre of existing networks of power and privilege. In this view, change occurs where systems are shocked, not where actors choose to take action. If shocks destabilize the practices established such

as technological disruption or social upheaval may cause institutional change which may change the position of the actors and some may find themselves better adjusted (Greenwood and Hinings 2006). Institutional perspective such as norms and values guide the actors to make strategic choices. This involves defining their own identity and interest which are key determinant for negotiations with other organisations. This is because the determinants lead organisations to define the external constraints and opportunities which affect the position of the actors (Child 1997; Lameck 2017; Rodrigues & Child 2008). The organisational theory elements such as institutional influence, resources and interests define how the actors cooperate. Therefore policies, regulations and social norms set the framework within which organisations operate.

Organisations are shaped by histories and the institutions which are not only external constraints and opportunities but are also embedded within organisations. The relationships they form, whether in a contract or a looser agreement, create a new organisational framework within which these previous commitments are played out and new ones may emerge. Overall the institutional influences, organisational structures and the choice of strategies determine the relationship between the actors.

Methodology

This study adopted qualitative approach with case study design. The area of the study was Kigamboni District Council (KMC) in Tanzania which was selected as a case study. The choice of KMC was influenced by the fact that KMC is one of the oldest LGAs which has been collaborating with NGOs in service delivery over the number of years but the quality and magnitude of services has not improved substantially. In addition, the NGOs operating in the council do not set their service delivery agenda with local government. Therefore, the research began with a content analysis of relevant documents such as National NGOs policy, guidelines for planning and decision-making, weekly schedules and monthly reports of the meetings. The review of documents provided the analysis of the formal rules governing collaboration between NGOs and Local Government in Service Delivery. The completion of the review was followed with in-depth interview with 74 respondents to gain their insight concerning collaboration between NGOs and KMC in service delivery. Of these, 30 officials were the policy officers from the NGOs working in KMC and 54 officials were the policy and field officers working in the local government from different departments of KMC.

For the purpose of ensuring reliability, the interactive questioning of the same respondents and probing was used. Apart from that, the researcher did not only organize interviews with officials, but also reviewed important

documents. Finally, the findings from the interviews were analysed using framework method and categorized according to the main themes of the research which are the task of policy officers and NGOs officials.

NGOs Institutional and Legal Framework in Tanzania

The current institutional and legal framework of the NGOs in Tanzania is a result of the amendment and the enactment of the NGOs policy of 2009 and the NGOs Act of 2002 (URT, 2002). The policy sets the objectives which are among other things; To provide an operational definition of NGOs; To provide a broad framework for legal and institutional arrangements to facilitate the operations of NGOs in Tanzania; To put in place registration procedures which are transparent, decentralized and which will facilitate better coordination of NGOs while safeguarding the freedom of association; To strengthen the relationship between the Government and the civil society; To enhance mechanisms for collaborative relations between NGOs, the Government, funding agencies and other stakeholders; To facilitate mechanisms for Government support to NGOs; To promote transparency, accountability and awareness among NGOs themselves, the Government and other stakeholders; To facilitate exchange and flow of information on NGOs activities in order to maximize utilization of resource and also share experiences or research findings (URT 2002).

In order to realize these objectives, the policy provides the number of mechanisms including establishment of the NGOs board and the ministry which is responsible for taking initiatives for coordination, publishing and updating NGO Directories information. The government is required to provide information relevant to NGO activities so as to promote a fair information exchange between the Government and NGOs. The National NGO Bodies, NGO Umbrellas individual NGOs, networks as well as NGO Resource Centers are given equal liberty to publish directories and produces publications of their constituents, clients and members but also the policy requires that all Local and International NGOs must produce activity reports and the reports must be made available to the public, National Bodies of NGOs, the Government and other stakeholders for use upon their request. All NGOs: both local and international are required to make available annual financial and / or audited reports to the Registrar's Office and other stakeholders but also each NGO must have physical address, a sign post and whenever possible notice board displaying its activities (URT 2002).

The Practice of the Policy

The review of the policy and guidelines for NGOs was followed by the number of field interviews with local government and the NGOs officials

to establish the practice of the policy. The results of the interviews were subsumed into the number of indicators of the policy practice as presented in the following sections below.

Awareness and Recognition of the NGOs

The interviews with heads of departments from the local government in (KMC) show that the officials are aware of the existence of the NGOs policy but they are not conversant with the policy contents because the policy is written by central government and that it has not been fully internalized in the local government. On the other side, the NGO official's interview shows that they are aware of the policy but also the details of the policy. For example 82.6% of the respondents from NGOs who were interviewed shows that they are fully aware and conversant of the NGO policy. It is only 17.4% of the respondents who were not knowledgeable about the content of the NGO policy.

To find out why the NGOs were knowledgeable on the policy than the government, the research further interrogated the NGOs directors. The interviews with the Directors revealed that they were fully knowledgeable of the policy existence and contents because the NGOs are required to adhere to the rules and regulations provided by the NGOs policy but also they have taken initiatives to ensure that all NGOs staff are trained concerning the policy and its contents. Therefore the results show that unlike local government staff, the NGOs staff were aware of the NGO policy contents.

Furthermore, the interviews with the heads of departments in Kigamboni Municipal Council and the NGO directors show that the contribution of NGOs is fully recognised in service delivery as remarked by the Municipal head of department of the – environment, welfare and community development as shown in the quotation below:

“We recognise fully the significance of collaborating with NGOs in service delivery since they act as partners with the government in the process of service delivery but also the NGOs can penetrate the grass-root areas where the government cannot.” (HOD – Environment)

“The government recognises the significance of cooperating with NGOs since they reduce the burden to the government in service delivery.” (Interview – HoD – Social Welfare and Community Development)

Furthermore, the recognition of the NGOs is supported by the fact that NGOs are potential agents in service delivery and the LGAs find it necessary to collaborating with the NGOs to address service gap caused by meagre resources provided by government. These findings are similar to the findings of the study conducted by Lange *et al* (2000) and Botha (2018) who found that the NGOs are fully recognised as the potential force in the service delivery since the government has realized that they

need assistance and they are incapable in their own in providing social services to the public and hence the necessity of collaborating with the NGOs in the service delivery is inevitable.

Resources Sharing

The research shows that sharing of the resources is one of the impetuses for the recognition of the NGOs as a potential partner in service delivery. In Kigamboni Municipal Council for example, the NGOs are recognised due to their involvement in different community based development projects. The research shows that 24% of the respondents recognise NGOs as an additional source of fund in service provision, 18% of the respondents remarked that involvement of NGOs in the provision of social services is what makes them popular and 12% responded that LGAs recognise NGOs involvement in social service delivery.

The researcher further interrogated the officials from Kigamboni Municipal Council to establish the potentials of NGOs as partner in resources sharing and the interviews revealed that NGOs are further recognised because of their technical expertise in project implementation as shown by the interview with heads of department of the Environment who argued through interviews that, *“The NGOs have high technical expertise which facilitates the implementation of social and economic projects in the community.”*

The interview also revealed that KMC cannot implement sufficiently development projects due to insufficient budget therefore the NGOs act as intercessors in implementing different development in the communities and promoting people’s welfare.

Institutions and Collaboration Between KMC and the NGOs in Service Delivery

In this question the respondents involved in the study were required to explain how the policy enhances cooperative public service delivery between the NGOs and Local government in service delivery. The number of officials from KMC and the NGOs operating in KMC were interviewed. The research shows that the policy enhances effective cooperative public service delivery. Big number of the respondents confirmed that the policy provides guidance and effective mechanisms for the collaboration of NGOs and LGAs in service delivery as stipulated in the NGO policy. For example 48.6% of the total interview participants show that the NGO policy enhances effective cooperative public service delivery by facilitating a platform for LGAs and NGOs to gather their concern. In this case, NGOs and LGAs can collaborate smoothly since they gather their concerns but also it helps them to minimize the negative attitude and perception they have towards

each other while 31.1% of the respondents confirmed that policy enhances cooperation by making the identity of NGOs possible through registration of the operating NGOs and finally 12.2% of the respondents interviewed confirmed that the NGO policy enhances cooperative service delivery by stating clearly the responsibilities of government and NGO in service delivery.

Therefore from the findings it is conclusive that the NGO policy is very crucial in facilitating effective collaboration between LGAs and NGOs. This is further supported by specific interview quotations from different officials of KMC as shown in the quotation below;

‘The policy act as a guidance for the NGOs operation but also it legalizes the registration process which gives the NGOs formal recognition and the autonomy to perform their activities’.

To get more insights on the requirement for registration, further probing with officials were conducted. The interview shows that the policy enhances cooperative service delivery since it facilitates the registration and provides the requirements for registration process of the NGOs. The head of department of social welfare and community development which is the department responsible for registration of the NGOs said that;

‘Our department is responsible for the registration of NGOs that operate in Kigamboni Municipal Council and the requirement for registration of the NGOs is that the NGO should have the license provided by the ministry responsible but also must have clear mission, vision and objectives.

Furthermore, the interview shows that the policy provides the responsibilities of NGOs and LGAs in service delivery. It provides the clear definition and division of responsibilities to facilitate the NGOs and the government to undertake their responsibilities without conflict as confirmed by the respondents who argued that, one among the mechanisms for effective cooperative service delivery is clear definition of the roles of each side. This helps to prevent misunderstandings between the parties and hence make them perform their roles smoothly. These findings are also consistent with the research by Lameck (2017) and Botha (2018) which shows that clear definition of roles and communication between the NGOs and local government improves the cooperation and the quality of service delivery by the NGOs.

Institutional Factors Undermining Effective Collaboration

Negative Attitudes and Information Sharing

According to National NGOs policy, it is a policy that NGOs must facilitate the exchange of information and regular dialogue among all parties

to maximize utilization of resources and minimize misunderstandings between the NGOs and LGAs in service delivery but also the NGO National Bodies and the ministry responsible for NGO coordination is required to take initiatives to publish and update NGO Directories information.

Nevertheless, the research shows that sharing and exchange of information between the government and NGOs in the service delivery is not effective. The HoD of health department in KMC argued that *“The exchange and sharing of information is not effective between LGAs and NGOs because NGOs are reluctant in disclosing and sharing information about their plans and budgets.”*

These findings imply that the exchange of information is one-sided. These findings are similar to the research by Lange et al (2000) and Gooding,(2017) which show that lack of transparency is one of the factors which affect effective collaboration between the LGAs and NGOs. The absence of transparency between the parties reduces the level of trust which is a catalyst for effective relationship and hence affecting the quality of service delivered through partnership.

Furthermore, the interview with KMC officials and NGOs officials shows that regular meetings is one of the major and crucial factors or strategy towards effective cooperative public service delivery since it provides a room for both NGOs and LGAs to gather their matters and concerns about their activities, problems and plans and hence minimize their differences.

For example, the interviews conducted with the HoD of the health department at KMC confirmed that regular meetings is a determinant factor for effective collaboration between the NGOs and LGAs in the service delivery and also the introduction of the networking system through meetings enhances effective collaboration as argued by the (HoD – Social Welfare Department).

“In Kigamboni we introduced a networking system of NGOs called (MTANDAO MWAMVULI) which is a networking system that gathers all NGOs of the same objective to work together in their activities. This helps to improve the effectiveness of cooperation between the LGAs and the NGOs.”

Negative Attitudes Towards Collaboration

The interview with the director of the NGOs titled *Aids Solution Kigamboni (ASK)* shows that some of the local government officials have some bad attitude towards NGOs. He further remarked that;

“Some local government officials have a bad and negative attitude, therefore, it becomes difficult to cooperate with them and they also have a bad perception about NGOs. This is because may be they encountered some difficulties or challenges with some NGOs which make them perceive that all the NGOs are the same.”

On the other hand the interview with local government officials especially heads of department in Kigamboni Municipal Council confirmed that negative attitudes is one of the factors which constrain the effective collaboration between the government and NGOs in service delivery. In addition, the leadership style and personal interest of the NGOs staff and the government leaders also affect the relationship between the parties as confirmed in the following quotation;

“Some NGOs are more concerned with their interests rather than community and public interests as it should be, the NGOs should operate and undertake their activities and operations to serve the community and provide social services on behalf of the government.” (Interview – Head of Department – Environmental)

Despite NGOs being fully recognised, NGOs still face challenges in service delivery. The NGOs officials confirmed to have challenges in collaborating with NGOs as confirmed by the respondents from the NGOs who argued that they faced challenges in cooperating with LGAs while only a few of the respondents from the government confirmed that they faced difficulties in working with NGOs.

The findings also discovered that negative perception is among the problems that affect collaboration between the government and NGOs in the provision of services. The NGOs and LGAs have negative perceptions towards each other. This causes misunderstandings in the cooperative public service delivery. These findings are consistent with other findings by (Bano 2019; Gooding 2017; Jelinek 2006; Lameck 2017) which show that the NGOs had difficult time to mobilize and work with government officials for day-to-day activities of the NGOs due to negative attitudes and perception. Therefore the role of NGOs in service delivery is often constrained by negative perception and attitudes which constrain the smooth cooperation of the NGOs and government in service delivery.

Conclusion

The overall conclusion is that the collaboration between KMC and the NGOs operating in the Council is not good. Although KMC recognises the existence of these NGOs and their benefits, it is not adequately aware about the contents of the national NGOs policy which is supposed to guide the collaboration between the two actors. One possible explanation is that the NGOs policy is developed by central government ministry and that the local government does not find it necessary to internalize it. On the other hand, the NGOs is aware about the policy and its content but also the NGOs is disposed of resources such as financial and human capital but they are not willing to disclose all their information to local government because of the negative attitudes. Therefore, apart from the formal institutions such as NGOs policy and the government structure particularly local

and central governments, lack of resources and the absence of effective communication between the parties severely constrain the effective collaboration. Therefore, seminars and workshops organised by the parties themselves can be greater instrument for improving collaboration.

Recommendations

First of all, the LGA officials should be made aware of the NGO official's policy because the awareness on policy will make the LGAs officials understand their role in the collaboration which can provide smooth and enabling conditions for the effective collaboration between LGAs and NGOs in public service delivery.

Furthermore, the government should build the capacity for cooperative public service delivery since the capacities of NGOs and LGAs are among the absolute factors which can improve collaboration between the NGOs and LGAs in service delivery.

Moreover, the government should increase the awareness and the benefits of involving NGOs in service delivery and also the types of resources the NGOs are disposed of. This in turn will enable NGOs to work effectively in the communities respectively and finally to achieve their objectives fully.

Apart from that, the government should improve mutual understanding between LGAs and NGOs through conducting regular meetings to discuss the matters of mutual interest. The focal point of the meetings should be the matters which affect the relationship between NGOs and Local government in service delivery and the strategies which can be used to reduce negative perceptions between the parties.

Finally, the government should create smooth registration process of NGOs and reduce the rigid bureaucratic procedures which the NGOs have been lamenting on. The registration process of NGOs should be made friendly to attract as many NGOs as possible to participate and assist the government in service delivery.

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Hell or High Water? An Analysis of the Murray-Darling Basin Water Plan

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Abstract

The Murray Darling Basin Authority (MDBA) and the Murray Darling Basin Plan (Basin Plan) water initiative sought to achieve a balance between the agricultural, economic and environmental water requirements of all stakeholders of the Murray Darling Basin river system. A substantial scholarly literature has arisen around both the MDBA and the Basin Plan, which have been criticised on various conceptual and empirical grounds, including that they have not achieved their intended aims, especially in terms of generating satisfactory environmental flows. This paper seeks to contribute to the scholarly literature on the MDBA and the Basin Plan by examining their genesis and evolution, identifying the main problems associated with their implementation and subsequent operation, and then proposing remedial policy intervention to address some of these problems.

Keywords: Australia, Murray-Darling Basin Authority, Murray-Darling Basin Plan, Public Economics, Public Governance, Water Policy

Introduction

A substantial conceptual and empirical literature has examined the formulation, implementation and operation of Australian water policy (Hussey & Dovers, 2006; Byrnes et al., 2006; Khan, 2008; Horne, 2013; Eberhard, 2018; Reutter, 2018). A significant strand of this literature has

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focused on the Murray Darling Basin Authority (MDBA) and the Basin Plan (see, for instance, Wheeler et al. (2020), Grafton & Wheeler (2018), Marshall & Alexandra (2016), Grafton et al. (2016), Hart, B. T. (2016) and Loch et al. (2018)).

Notwithstanding a long history of Australian water policymaking, a broad consensus exists that many policies have failed to achieve their intended objectives. For instance, with respect to the application of the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* to protect freshwater ecosystems, Nevill (2007, p.43) has noted that ‘the development and application where appropriate of nationally consistent principles for management of reserves has not taken place’. Similarly, in their analysis of the institutional arrangements for allocation of water resources in Australia, Young and McColl, (2003, p. 228) have demonstrated that for the Murray River, water allocations often exceeded the cap by 20 per cent. Moreover, inconsistent water licensing systems existed in each river state, with Victoria and South Australia having ‘use it or lose it’ policies, and New South Wales allowing unused water to be carried over.

This paper seeks to contribute to the literature on the MDBA and the Basin Plan by examining the genesis of the MDBA and the Basin Plan, identifying the main problems associated with their implementation and subsequent operation, and then proposing remedial policy intervention to address these problems. The paper is divided into four main parts. The next section briefly describes the genesis of the MDBA and the Basin Plan, whereas the subsequent section focuses on the various shortcomings of this water initiative. The section that follows it sets out four policy proposals to address the problems surrounding the MDBA and the Basin Plan. The paper ends with some brief concluding comments.

Genesis of the Murray-Darling Basin Plan

The Murray-Darling Basin Plan (‘the Plan’) is an emblematic public policy devised to mitigate the depletion of common water resources in the inter-jurisdictional and sub-federal Murray-Darling Basin and accompanying external costs. Compared with other river systems elsewhere of similar magnitude, the Murray-Darling Basin experiences a relatively high level of variability and low average rainfall (Quiggin, 2001, p. 68). The externalities of the Murray-Darling Basin derived from irrigated agriculture are vast and interrelated. Quiggin (2001, p. 70) categorised the problems specific to the Basin into five main areas: land salinity, loss of biodiversity, land degradation, river water salinity and water quality. These problems are

compounded by the fact that the Murray-Darling Basin is a ‘low-energy system’ (Connell & Grafton, 2011, p. 1), with only limited capability to endogenously expulse salts and sediments.

The inter-jurisdictional span of the Basin, and the resultant constraints on Basin-wide policy design and implementation, were addressed through the *Federal Water Act 2007*, which allowed for intergovernmental and legally binding policy to be implemented to tackle this ‘highly contested resource’ (MDBA, 2019a, p. XI). These inter-jurisdictional problems had arisen largely as a result of a lack of constitutional authority for federal government intervention to supplant the jurisdictional authority of each individual Basin state and to intervene in the collective interests of all Basin states.

With all its complexities, the Plan was designed to be implemented by the Murray-Darling Basin Authority (MDBA) from its inception in 2012 until 2026. However, notwithstanding the Plan’s genesis as an ostensibly exemplary instance of cooperative federalism, its implementation faced tremendous hurdles, with complications stemming *inter alia* from path dependencies inherited from the earlier era of ‘expansionary water policy’ (Randall, 1981, p. 196) and complications arising from balancing socioeconomic concerns against the ‘best available science’ on determining the specific quantity of water to allocate to the environment (Walker, 2019).

Expansionary Water Management Policy

The most drastic change to the Murray-Darling Basin in terms of regulation occurred at the conclusion of the nineteenth century, when riparian rights were converted into statutory water rights by the (then) independent colonies (Connell & Grafton, 2011, p. 1). Subsequently, the goal of economic development substantially influenced the public policy agenda and was thus reflected in the ‘expansionary’ water policy of later periods (Randall, 1981, p. 196).

Quiggin (2001, p. 73) recognised that recent developments in public policy regarding the Murray-Darling Basin reflected the constraints of a maturing water economy. Despite efforts to conserve water resources in the Murray-Darling Basin since the peak ‘Federation Drought’ in 1901 (Quiggin, 2001, p. 72), it was not until 1980s when empirical evidence of adverse externalities emerged that Basin states opted for loosely-knit cooperative action through the Council of Australian Governments (COAG), and the newly-established Murray-Darling Basin Ministerial Commission (MDBMC).

Randall (1981, p. 196) has noted that the inevitable end of the expansionary phase (characterised by low social cost of expanded water use and the associated exploitation of irrigation opportunities) was followed by a mature water economy marked by incremental increases in the cost of water and direct and intense competition by competing users of water. Quiggin (2001, p. 73) observed that – in this mature phase – the complexities of resource management are worsened by path dependency arising from the sheer persistence of the policy framework of the expansionary phase.

The COAG agreements essentially reinforced a preference for ‘price-and-market-based’ policy instruments for dealing with environmental externalities (Quiggin, 2001, p. 76). The relatively new MDBMC recognised the environment as a legitimate user of water and enacted the 1997 ‘cap’ which set a permanent upper limit on water diversions from the Basin. While jurisdictions were obliged to comply with the cap, Crase et al. (2013, p. 209) found that enforcement of the cap lacked substantial penalties for breeches that bred difficulties in compliance enforcement and management. Moreover, the cap did not cover most of the northern segment of the Murray-Darling Basin, nor did it cover groundwater, despite numerous official statements of intent (Connell & Grafton, 2011, p. 3).

Need for Coordinated Federal Policy

In 2000, a COAG review found that in the counterfactual absence of the cap, environmental degradation would have continued at a faster rate than had been the case (Connell & Grafton, 2011, p. 3). A subsequent scientific panel commissioned by the MDBMC found that improved operations and a 3,350 gegalitre (GL) increase in inflows for the environment were required for a ‘high’ probability of success.

Political discontent from rural interests resulted in the Howard Coalition Commonwealth government abandoning this view in favour of subsidies for infrastructural improvements and water entitlement purchases through the new *Living Murray First Step* program. Byrnes, Crase and Dollery (2006, p. 438) noted that, in the interests of improving sustainability, the Howard government placed emphasis on the role of urban water use, which in the initial reforms, was subjected to relatively modest scrutiny.

In terms of water pricing policy, Grafton and Hussey (2007, p. 22) found that the policy suffered from two critical defects. First, users of water did not pay a price sufficient to reflect the value of keeping the water ‘*in situ*’ in terms of the benefits generated from non-use. Second, any purchase of water for the environment was conditional on users implementing infrastructural investments for improved water efficiency. As a result, Grafton and

Hussey (2007, p. 22) argued that the final water purchase price paid by the federal government was greater than required for economic efficiency. Accordingly, they recommended that Commonwealth government policy be amended to maximise the volume of water for the environment per dollar of expenditure.

In March 2008, the incoming Rudd Labor government increased the environmental water allocation to \$13 billion over 10 years and rebranded the program as *Water for the Future*, although it shared much in common with its predecessor (Cruse et al., 2013, p. 210). With bipartisan support, the *Water Act* was passed enacting the program and providing a legal basis for a new Basin Plan. Grafton (2010, pp. 25/26) found that, by the end of 2009, the federal government had spent in excess of \$1.2 billion to acquire approximately 800 GL of water entitlements.

Murray-Darling Basin Water Plan and the Murray Darling Basin Authority

A fundamental notion of the *Water Act* was that sub-federal control over water resources had failed to mitigate the declining health of the Basin's riverine environment and consequently federal government intervention was warranted (Cruse, Dollery, & O'Keefe, 2011, p. 123). The *Water Act* simultaneously established the MDBA, thereby replacing the MDBC. In common with the policy development stages in the *Living Murray* program, the MDBA was mandated to develop a Basin Plan that was informed by scientific expertise to determine the effective level of water divisions required to produce long-term ecological sustainability (Cruse et al., 2013, p. 210).

In many ways, the instruments used in the Basin Plan were similar to its predecessor *Living Murray* and *Water for the Future* programs. The Australian government would subsidise developments to improve the irrigation efficiency of on-farm and off-farm water infrastructure, with the stated intent of retrieving water for environmental interests (Williams and Grafton, 2019, p. 2). In return for subsidies, irrigators are required to forfeit a share of the water savings – typically amounting to 50% – to the Commonwealth Environmental Water Holder, a federal government entity responsible for accumulating water entitlements for environmental interests. These water savings accumulate towards a Sustainable Diversion Limit (SDL), which was to be determined by a scientific reference panel, similar to the *Living Murray* program. Some of these water savings are then allocated to the environmental water component of the Plan to secure the ongoing sustainability of the Murray-Darling Basin ecosystem.

Problems with the Murray-Darling Basin Water Plan

Compromised Sustainable Diversion Limit

While the MDBA determined that 7,600 GL denoted the upper limit of water for environmental allocation, it determined that this volume would have negative socioeconomic consequences (Crane et al., 2013, p. 210). Accordingly, water savings of between 3,000 and 4,000 GL was to be designated as the SDL.

The *Water Act* required that consultation with regard to the SDL be conducted in a timely manner. However, the MDBA released a guide to the proposed Plan, and then proceeded with an extensive consultation period, with its board members, hosting meetings in prominent irrigation regions. These meetings were characterised by sustained criticism from irrigators, who were exasperated with decades of discussion on water reform and associated ‘consultation fatigue’ (Crane et al., 2013, p. 210). Uncertainties surrounding the effectiveness and ecological outcomes of environmental water allocations may also have nurtured these sentiments.

Following public meetings, separate legal advice was released, which suggested that the methodology employed by the MDBA on achieving a balance between environmental and socioeconomic factors could be flawed (Crane, O’Keefe, & Dollery, 2011, p. 196). Subsequently, the MDBA chair resigned and was replaced by a retired politician. Following additional consultation, the final Plan encompassing an SDL of 2,750 GL was released and was adopted with bipartisan support in the Australian Parliament.

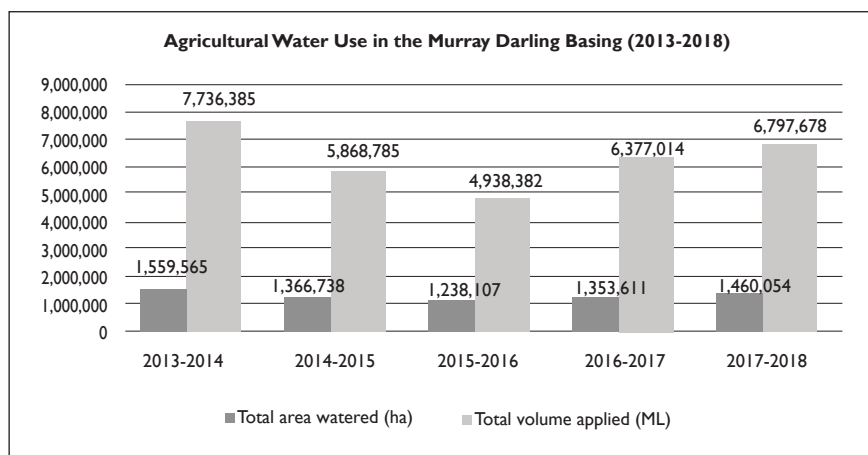
Water Theft

An exposé by the ABC public broadcaster led to several prosecutions for alleged water theft. One operator upstream from Barwon-Darling faced prosecution for extracting water during low flows, when water pumps meters were inoperative (Davies, 2019b). Reports indicate that the NSW state government had ignored reports of large irrigators pumping water illegally. An irrigator who claimed to have been told that pumping was permitted by the then Minister for Water, pleaded guilty for pumping during low flows. Following the ABC *Four Corners* report, members of the South Australian Parliament, alongside environmental groups, called for an independent investigation (Chan, 2019).

Several media reports claimed that operators in NSW had engaged in water theft, with the NSW Coalition government turning a blind eye, given its role in representing rural interests (Davies, 2019b). The resultant turmoil ultimately resulted in prosecutions and spawned an independent inquiry heavily critical of the NSW government led by Ken Matthews (2017), which resulted in some reforms.

Over-irrigation

Figure-1: Water Used on Australian Farms (4618.0), 2013 to 2018 (Australian Bureau of Statistics, 2019)



An Australian Rivers Institute report (Sheldon, 2019) – commissioned by the NSW Natural Resources Commission – found large-scale water irrigation upstream from the Barwon-Darling. Of the 237 water access licences held by 158 licence holders, 86% of the shared component of the river was controlled by 10 licence holders (Sheldon, 2019, p. 12). The top three controlled about 75% of the shared component of the river. The report noted that high levels of water irrigation, particularly by cotton growers, had prematurely forced the river system into a state of hydrological drought, some three years early.

As illustrated in Figure-1, recent data indicates that overall irrigation has increased in the Murray-Darling Basin from 2015. As well as an increase in irrigation, the total area watered has also increased since 2015, indicating that, despite water efficiency measures and water entitlement repurchases, total crop areas have increased. Moreover, the Australian Bureau of Statistics (2019) found that the volume of water irrigation increased by 7% to a total of 9.7 million megalitres (ML) between 2017 and 2018. Cotton now accounts for 28% of all irrigation water used, and the volume of water applied has increased by 7% to a total of 2.7 million ML, with the total area irrigated increasing to 359,000 hectares (a 10% increase).

Water Buybacks without Lenders

The Coalition Commonwealth government has also been subject to continuing criticism (McCormick, 2019). The Commonwealth water minister had controversially signed off a tender submitted by Eastern Australia Agriculture (EAA), a firm that was founded by the energy

minister years before the minister's entrance into politics (Davies, 2019a, 2019b, 2019c). This tender was accepted without any scrutiny of the tender process. It subsequently transpired that Colliers International – the firm that had been engaged by the federal government to provide it with valuation advice – had previously acted as an agent to sell the two properties of EAA (Davies, 2019a).

Documents obtained by the media indicated that the federal government was aware that the buyback of the water from EAA would only be available intermittently and that it 'would have virtually no impact under low-flow years when the region is more vulnerable' (Davies, 2019b). In October 2019, the Commonwealth Environmental Water Holder confirmed that water rights purchased from EAA had not yielded any water at all (SRRATLC, 2019, pp. 18-21). A pattern of undermining of the Basin Plan, largely as a result of partisan party politics and individual Basin states protecting irrigation interests became evident.

Conflicting Water Valuations and the Basin Plan

The firm Webster Limited had sold water for \$78 million to the Commonwealth government without a tender process from its property named Tandou (Davies, 2019d). Documents obtained by the press reported that the NSW government had interest in purchasing Tandou's water because it would enable NSW to reach its SDL target, without having to repurchase water entitlements from irrigators (Davies, 2019d). The NSW Office of Water had argued that it was beneficial to purchase water rights from large rights holders, as opposed to clusters of smaller rights holders, because of reduced transaction costs.

While the NSW Office of Water had indeed sought advice from the Australian Bureau of Agricultural and Resource Economics (ABARES) to value the water, entitlements held by Tandou, it ignored the valuation and then relied on an earlier valuation by private valuer HTW (Davies, 2019e). Tandou's water portfolio was valued at \$24.8 million by the ABARES, while HTW valued it at \$38 million, with an additional \$40 million in compensation for the loss of value of the property (Davies, 2019e).

HTW's valuation was heavily criticised by the ABARES, which argued that its prices were greatly inflated, and it was especially sceptical of the land value compensation valuation (Davies, 2019e). The head of NSW Department of Primary Industry's water division resigned, subject to corruption investigations (Davies, 2019e).

Reliability of Water Purchased in Doubt

An Australia Institute report suggests that the Commonwealth government paid an excessive price for water from EAA that was virtually impossible to use for environmental purposes because the purchased water comprised

overland flow licences (Slattery & Campbell, 2019, p. 16). Overland flow licences that are attached to a given land area have no legal status outside the land from which they originate. Water can thus be legally extracted by other irrigators (Slattery & Campbell, 2019, p. 1) and taxpayers would have to pay again to purchase an equivalent amount.

The Australia Institute report further contended that ‘vendors largely ran the process by which the volume and price of this purchase was determined’ (Slattery & Campbell, 2019, p. 16) and about half of the water recovered would not accumulate towards the SDL since overflow licences are not equivalent to river flows. The newly appointed minister for water has committed to investigating the water rights purchased since 2008, as recommended by the Auditor-General (Sullivan, 2019b).

Exploitation of Subsidies

A cornerstone of the Basin Plan was subjected to opportunistic exploitation. Firms have reportedly been misusing the subsidies program to use more irrigation water from the Basin. Large parts of the river system have been transformed into areas used for the production of water-intensive crops, such as cotton and nuts (Rubinsztein-Dunlop et al., 2019). For instance, Webster Limited disclosed that it had surrendered \$22 million in water licences in return for \$41 million in infrastructure-subsidies. Moreover, some subsidies have been used to build dams designed to stockpile large quantities of ‘opportunity water’ pumped from heavy rainfall (Rubinsztein-Dunlop et al., 2019). This unlicensed water would have otherwise flowed downstream and contributed to the revival of the Basin ecosystem.

In sum, the array of government incentives and subsidies has not only induced greater irrigation through the establishment of water-intensive crops, but also incentivised firms to engage in inefficient infrastructure programs to store ‘opportunity water’. This has served to damage the Basin ecosystems that depend on inflows of rainwater. In addition, ‘opportunity water dams’ are subject to heavy evaporation that would render them unprofitable without the subsidies in the Basin Plan.

Murray-Darling Basin Authority Compliance Regime and ‘Commercial In-Confidence’ Activity

The SA Royal Commission into the Murray-Darling Basin unearthed a lack of transparency by the MDBA and, to a lesser extent, the CSIRO (Walker, 2019, p. 16). The details of the recipients of subsidies and the manner in which subsidies were used were not publicly disclosed (Rubinsztein-Dunlop et al., 2019). The MDBA was accused of maladministration, unlawful conduct and negligence, which the MDBA denied (MDBA, 2019c, p. 1).

The Commission further criticised the MDBA for insufficient consideration of the proper and lawful administration of the *Water Act* (Walker, 2019, pp. 49/53). Despite the requirement that the SDL be determined by means of ‘best available scientific knowledge’, the MDBA had neglected climate change in its modelling (Walker, 2019, p. 54). Walker (2019, p. 54) argued that politics rather than science had ultimately determined the SDL under the guise of ‘triple bottom line’, an approach that is not an obligation under the *Water Act*. The Commission argued that the *Water Act* does not require a political compromise and that ‘socio-economic considerations, ideology and realpolitik are not involved’ (Walker, 2019, p. 53) in the course of determining the SDL.

In addition, the MDBA managers had pressured the CSIRO to amend segments of the ‘multiple benefits report’ so that it no longer reflected the view of the authors (Walker, 2019, p. 54), noting that the modelling used by the MDBA was also never made available to the public, with the exception of the CSIRO and several reviewers (Walker, 2019, p. 53). The Commission noted further that the ‘Ecological Elements Report’ was founded on a ‘highly simplified hydrogeological model’ and it was ‘not intended for site-scale planning or assessment of works and measures scenarios’ (Walker, 2019, p. 60). Moreover, the MDBA failed to provide Basin communities and its critics with scientific evidence on its environmental plans (Crane et al., 2011, p. 197).

The MDBA and the Commonwealth government were further criticised for their failure to properly resource ‘appropriate metering and monitoring’ (Walker, 2019, p. 49). Moreover, affected farmers themselves disclosed to the press that the MDBA had overpaid them for relinquishing their water rights and, in some cases, farmers purchased water rights for a price lower than the price received for surrendering their original water rights (Rubin-Zstein-Dunlop et al., 2019). Irrigators also expressed dissatisfaction that some non-farming interests had been trading water entitlements, which had increased the price of water purchased by farmers. Finally, some recipients of subsidies revealed that they would have undertaken infrastructural improvements for water efficiency regardless of government intervention through subsidies.

The Commonwealth Treasurer has since ordered the Australian Competition and Consumer Commission to investigate water markets (Sullivan, 2019a) following the Auditor-General’s advice (Sullivan, 2019b).

Water Savings Overstated

Contrary to claims made by the federal government, after an analysis of water balance data from irrigated cropping Williams and Grafton

(2019) found that the water entitlements acquired had resulted in only small improvements in net stream and river flows and may have even reduced such flows. Williams and Grafton (2019, p. 2) noted that some \$3.5 billion have been spent by the Australian government to improve the irrigation efficiency for on-farm and off-farm water infrastructure. While the Commonwealth government claimed that 700 GL of water have been recovered for the environment, Williams and Grafton (2019, p. 8) estimated it had been a mere 70 GL of net flows.

Finally, the MDBA grossly failed to account for the actual savings by not adopting reliable peer-reviewed methodologies. Williams and Grafton (2019, p. 8) estimated that the method of water buybacks using subsidies for water efficiency improvements cost taxpayers some \$50,000 per ML of water. Moreover, they found that if an alternative scheme of directly purchasing water entitlements from willing sellers had been employed, it would have been around 25 times less costly. In response, the MDBA maintains that the water savings claimed by it were backed by an independent review conducted by the University of Melbourne (Wang, Walker, & Horne, 2018).

Remedial Measures

Given the problems afflicting the MDBA and the Basin Plan, the analysis now considers four remedial policy measures that could alleviate the resultant damage that has been inflicted.

Consultation and Rent Seeking

The final SDL was not only significantly lower than the 7,600 GL upper limit proposed by scientists, but also even lower than the initial SDL minimum of 4,000 GL. Moreover, it fell below the subsequently adjusted level of 3,000 GL, after socioeconomic considerations were factored in. It thus appears that ‘regulatory capture’ of the MDBA may have induced it to favour socioeconomic considerations, aided by a degree of maladministration, as suggested by Walker (2019). The net result of a compromised SDL is an ineffective Basin Plan with insufficient environmental diversions. In sum, water policy failed and fell short of providing its expected benefits, even after the affected communities endured policy shocks and disruptions as a result of government intervention.

Cruse et al. (2011, p. 197) considered the MDBA’s failure to anticipate criticism and communicate its case effectively. Moreover, both Cruse et al. (2011) and Wheeler (2019) considered the implementation of the Basin Plan to be an example of inadequate communication and consultation due in part to the early release of the Plan, followed by a lengthy consultation process during which MDBA may have been manipulated by vested interests.

Wheeler (2019) has noted that vested interests seldom fully reflect the views of all the stakeholders they claim to represent. In contrast to the process followed by the MDBA, Wheeler (2019) argued it would have been better to consult stakeholders in the early stages of policy development, rather than after recommendations have been presented. In line with Crase et al. (2011), Wheeler (2019) suggested that consultation should be inclusive and not limited to vested interests that purportedly embody stakeholder preferences. Moreover, Wheeler (2019) suggested that recognising 'true' stakeholder preferences earlier in the policy process would have assisted in identifying efficient policies that promote adaptability.

Define a Compliance Regime

A major problem with the Basin Plan's operation lay in its ill-conceived compliance regime. The basic thrust of the Plan should have held Basin states responsible for meeting their own targets, as established by the MDBMC, with the MDBA operating a compliance regime. Moreover, both the Basin states and the federal government could increase the probability of effective compliance by investing in providing informational symmetry to the recipients of subsidies and the MDBA. This would have replaced trust with accurate shared information on the operation of the Plan.

This approach was proposed by Vining and Weimer (1990) and it is especially relevant in the case of the Basin Plan. Improved information in the hands of the MDBMC would oblige the MDBA to offer effective compliance. Should the MDBA be perceived as performing poorly, then the MDBMC could intervene by transferring compliance to existing state regulators, take over the function themselves or simply establish a new regulator.

It is also important that the MDBMC stipulate clear *ex ante* compliance terms so that instances of managerial discretion are restricted, and the possibilities of rent capture are reduced. For example, the disbursement of subsidies to irrigation interests operating at the time of development of the Basin Plan, to the exclusion of new farming developments, especially the water-intensive farming and infrastructure developments that were counterproductive to the intent of the Plan, should have been restricted. Put differently, if the disbursement subsidies were indeed inevitable due to political factors, they should have been limited to communities affected by the SDL at the time, in accordance with the original intent of the Basin Plan.

Adopt Decentralisation

Fiscal decentralisation (Oates, 1999) could provide a benchmarked means for a more effective Basin Plan. A grant program could be designed to increase intergovernmental competition and curb rent-seeking by interest

groups. This could occur through the provision of federal grants to individual Basin states to pursue their own water entitlement purchases, under the watchful eye of the MDBMC, where proposed purchases would be carefully scrutinised. Water purchases should also be subject to the MDBA's compliance regime, reporting to the MDBMC and the federal government.

Similarly, subsidies could be dispersed as federal grants to individual Basin states through the MDBMC acting as an intermediary, thereby fostering competition for subsidies between Basin states. Competition could incentivise Basin states, their agencies and local governments, which possess superior local information, to pursue proven water-efficient infrastructure programs, subject to scrutiny by the MDBMC. The MDBA could also audit the claimed water savings of these programs.

Eliminate the Subsidies Program

Without subsidies for infrastructural improvements, the federal government could purchase a significantly larger amount of water for the environment (Grafton & Hussey, 2007). Moreover, Williams and Grafton (2019) have estimated that this would be around five times cheaper than present costs. Thus, in line with Grafton and Hussey (2007) and Williams and Grafton (2019), the federal government should pursue a water entitlement purchase program that yields the highest return, as measured by water saved for the environment for a given level of government expenditure. Under this arrangement, water entitlement holders would be free to make privately funded infrastructure upgrades that would yield greater water efficiency and then sell their water savings to the federal government. A decentralised and market-based approach of this kind would place the onus of water savings on the irrigators who undertake infrastructure projects. It would remove the need for the state intervention in the appraisal of water savings made by private firms, which given informational asymmetries, has hitherto been ineffectual. Undertaking inefficient infrastructure programs would be penalised in the marketplace with sellers competing on price.

Conclusion

This analysis has sought to provide a synoptic account of the genesis and operation of the MDBA and the Basin Plan, together with its main shortcomings. The paper then proposed four remedial policy measures that could be adopted to limit the degree of policy failure and improve the future performance of the MDBA and the Basin Plan. It is worth stressing that the remedial policies proposed in this analysis address only some of the problems afflicting the MDBA and the Basin Plan. Much remains to be done.

A central theme running through our analysis is that incentive structures and the efficacy of information transmission are pivotal in determining the efficiency of market-based instruments imposed through public policy intervention. In the case of the MDBA and the Basin Plan, an efficacious market-based policy intervention should place a socially optimal price on water diversions, including the value of Basin water *in situ*, after re-purchase of water entitlements. Future research in the area could fruitfully be conducted on the externalities of the non-use of Basin water, so that prices can reflect *in situ* cost of Basin water diversions.

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Financing Urban Infrastructure in India: An Expedition

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Abstract

From the last few decades to the present, urban Infrastructure in India has seen an enormous advancement with rapid growth of urbanization. For sustaining the fast pace of urbanization in the coming years, financing Urban Infrastructure has become vital. In spite of the efforts made by the Government and Policy Makers to make the Urban Infrastructure Financing more effective, still there is a long journey ahead to achieve the integrated Urban Infrastructure Development. This paper presents the journey of Urban Infrastructure financing in India through three phases (Planned economy, Reforms Phase and market economy) i.e., the historical evolution of funding arrangements for Urban Infrastructure Development. How the conventional urban financing mechanism (Municipal Finance) has transformed to non-conventional & innovative financial mechanism (Urban Infrastructure Financing) over a time is also discussed.

Keywords: Mechanism, Municipal Finance, Reforms, Urban Infrastructure, Urban Local Bodies

Introduction

India is one among the countries, where the process of urbanization is an integral part of the development. India has been progressively becoming an urbanized society. Of the total Indian population, urban component constituted 11.4% as per 1901 Census. This proportion has increased to 28.3% in 2001 Census. As per the World Bank data, it has further increased to 34% and 34.47% in 2017 and 2019 respectively. As per Wikipedia, a study by UN states that, by the year 2030, 40.76% of Nations' population will be expected to live in urban territories.

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Expeditious ascend in Indian urban population is paved a way for various quandaries like formation of informal settlements, diminution in quality of living, by which causing habitats deterioration. This situation started creating a demand for qualitative as well as quantitative urban amenities. To provide these amenities for the communities in the Urban Local Bodies (ULBs) necessitate sizeable capital investments and operating costs. This emphasizes that ULBs need to raise the resources, specifically capital investments. Further the financial requirements may vary with the range of the ULBs.

The most important option for ULBs in India is to improve own tax revenue either by enhancing tax rate or tax base or both. ULBs may increase capital receipts (mostly borrowings) by accessing the market-based financing for their infrastructure which includes various types of financing alternatives i.e., municipal bonds, municipal credit rating, and pooled financing and various innovative Urban Financing Instruments/Models. Hence the financing of urban infrastructure in broader way comes into existence.

This study is mainly based on secondary sources of information. This study is organized in the sequence of historical & present scenarios and is classified into various sections including introduction, urban development situation during pre and post-independence scenarios respectively. It further discusses the Municipal Finances, explains the Evolution of Urban Infrastructure Finance and interprets the Journey of Financing Urban Infrastructure. Estimates and Status of Urban Infrastructure Financing and the Conclusions are given in last.

Traces of Urban Development: Pre-Independence Era

The traces of Urbanization and Urban Development can be seen in pre-Independence era. The roots of the Urban Local Bodies can be found in the ancient India i.e., Indus Civilization, Iron age, medieval period and emperors of Vijayanagar Kingdom. The concept of Local Self-Government is creation of British, the then Governor General of India (Lord Mayo) in 1870 passed a declaration for local interest, empowering Local Bodies, effective administration and financial management.

India's Municipal Governance in its present structure has existed from the year 1687 with the establishment of Madras Municipal Corporation, and after that Calcutta and Bombay Municipal Corporation in 1726. The Government of India Act, 1935 in the Federal constitution, the subject matter of local self-government was allocated to provinces. According to Census data: about 11.4% people lived in urban areas in the year 1901.

Urban Development: Post-Independence

The Constitution of India, came into force from 26th January, 1950 adopted the replica of the Government of India Act, 1935 and allocated the subject matter of local-self Government to the State Governments. Despite several Committees and Acts, the Municipal Self-Government and its finances remained in insignificant state. Municipal Governance includes various activities like Roads, drainage, water supply etc. This is known as Municipal Governance and Financing of these activities is known as Municipal Finance.

Municipal Finance

Municipal Finance as part of Urban Governance is a subject matter of the State Government in the federal structure. Accordingly, respective states devolve power as per the article 243 of Indian Constitution and specify revenue base along with the functional domain of Urban Local Governments. The Central Government promulgated the 74th Constitutional Amendment Act (74th CAA) of 1992 which distinctively includes fiscal decentralization covering financial management, devolution of funds to Urban Local Bodies and efficiency in Municipal expenditure.

The Structure of municipal finance includes Taxes, Non-Taxes, Fiscal Transfers, Loans and Grants, Capital Receipts and Contributions. Revenue and expenditure decisions are the crux of municipal finance in the municipal governance. The revenues of the Municipal Governance – taxes (property tax, vacant land tax), user charges, and transfers between the governments. The application of money includes expenditure on establishment, operations and maintenance, capital projects and debt repayment. Municipal finance is financing infrastructure components through the use of revenues received and borrowing and also addresses issues of expenditures and its accountability.

Prior to 1990's, urban infrastructure of the Urban Local Bodies was financed primarily via Own tax revenue, budgetary support, Central and State governments Grants, Plan and Finance commission funds.

Infrastructure development has never been a top priority before economic reforms 1991. The priority of 1991 reforms was to manage the economic plight and stabilization of domestic and external affairs. Infrastructure services in India are slowly and steadily shifted from the government reign to private reign. The government sector commanded the private till 1991, which played a secondary role in the system. In the last few years, India has developed tremendously in manufacturing and infrastructure, thanks to the contributions of the sectors: Public and Private.

The 74th Constitutional Amendment Act (CAA) of 1992 gives out constitutional status to Municipal Bodies and defined their functional

fields, i.e., devolving resources, and responsibilities to the ULBs. However, a commensurate devolution of financial autonomy was lacking due to lack of commitment in implementation of the Act by the political leaders.

The financial constraints of the Urban Local Bodies are with respect to Municipal Expenditure and Municipal Revenues.

- The municipalities need to balance their budgets, by Law. The actual municipal expenditure to be incurred is therefore much lower than the required expenditure. Any municipal borrowing has to be approved by the state government. Conventionally the capital expenditure was a Plan activity and was not part of the concern of State Finance Commissions (SFCs) which were expected to cover revenue expenditure requirements. The planning commission was in charge of the planning, with the abolishment of Planning Commission from 1st January, 2015, the planning activity was adversely affected and decentralization also suffered.
- Given their inadequate revenues, If the ULBs were to increase their expenditure to the required levels, they need to borrow from the capital market. But borrowing is only possible if the local governments can improve their resources, revenues.

In a micro view the financing of a ULB / Municipal Corporation by way of own resources and Grant-in-Aid from the State / Central Governments is known as Municipal Finance. Whereas in Macro view the financing of ULB / Municipal Corporation is done by own resources and Grants-in-Aid as well as by attracting the private capital through borrowings, Municipal Bonds, public private partnerships or any other innovative urban financing instruments is known as Urban Infrastructure Financing.

Evolution of Urban Infrastructure Finance

The evolution of Urban Infrastructure Finance in India will be examined in three Phases as below:

- Phase-1: The Phase of Planned Economy (1947-1991)
- Phase-2: The Phase of Reforms (1991-2015)
- Phase-3: The Phase of Market Economy (2015 onwards)

Phase-I: The Phase of Planned Economy (1947-1991)

During this period, developing infrastructure ULBs relied on State and Central Governments assistance by way of grants and institutional support. Traditionally, the infrastructure of ULBs, particularly Municipalities & Municipal Corporations, has been financed through budgetary allocations or ULBs' own revenues, grants, loans etc. In general, the Central and State Governments grants and loans are used to fund urban infrastructure, whereas ULBs' own revenues are used to meet operational and maintenance costs

of the facilities. The exercise of State judgement in governance resulted in a misalignment of the ULBs' functions and finances.

Municipal Finance is the traditional method of financing urban infrastructure. Municipal functions include planning for development, upgrading functions related to public health and welfare, and so on. However, municipal functional devolution is not supported by the necessary authority. Many commissions, including the Local Finance Committee (1951) and the Taxation Enquiry Commission (1955-54), were setup to examine the ULBs financial aspects. Even today, the allocation of funds to ULBs is at the discretion of state governments.

The dependency of the ULBs on the budgetary support, to address intense urban infrastructure, deficiencies in service delivery, and proliferation of squalid necessitated the redesigning urban strategies i.e., plans and policies and upgradation of infrastructure was identified as a key requisite for economic advancement. Accordingly, A dedicated coordination wing was formed to identify problem areas that needed immediate attention and to eliminate major obstructions. The National Commission on Urbanisation (1988) acknowledged the ULBs' dire financial situation and, in addition to advocating a considerable increase in plan outlays, proposed private finance and the introduction of user fees. Then, to assure a return on investment and observable changes within the institutional and regulatory framework, urban development programmes included private financing choices and reforms were led at the ULB level.

The Sixth Five-Year Plan (1980-85) put a strong emphasis on the development of small and medium-sized towns by providing essential services in the areas of lack of amenities and by benefitting with CSS Scheme 'Integrated Development of Small and Medium Towns' (IDSMT) with the goal of encouraging growth in urban areas with populations of less than one lakh through qualitative and quantitative infrastructure development.

The seventh Five Year Plan (1985-90) signalled urban policy changes by adopting the practice of allowing private sector in Urban Growth. It was suggested for establishment of a National Housing Bank to improve the scope of Housing Finance. It also proposed to setup a National Urban Infrastructure Development Finance Corporation (NUIDFC) to help Urban Local Bodies to expand their potential. During the plan period, the Urban Basic Services (UBS-1986) Scheme was also introduced, with the objective of enhancing the well-being of urban households through community participation, inclusive growth, and economical plans. In order to assist those who are unable to afford housing, the first National Housing Policy (NHP-1988) was promulgated.

During the Seventh FYP period (1985-1990), the National Commission on Urbanisation (NCU-1988) identified 329 cities as Generators of

Economic Momentum (GEMs) divided into National Priority Centres (NPCs) and State Priority Centres (SPCs), with the expectation of potential urbanisation development through these centres.

In India, municipal finances have played a minimal influence in the country's overall governmental finances both before and after independence. They were characterised primarily by a limited resource base, a lack of autonomy, a limited capacity to generate revenue on their own, and internal inefficiencies in financial management. As a result, there was a heavy reliance on transfers and grants-in-aid at the union and state levels.

Phase-2: The Phase of Reforms (1991-2015)

Post-1991, significant emphasis has been placed on examining alternate finance sources for urban infrastructure. Three sources provided the push for:

- Financial institutions have been obliged to allocate money more efficiently as a result of economic liberalisation and increasing competition, moving away from incompetent financing strategies.
- ULBs have been accorded constitutional status by passage of the 74th constitutional amendment.
- The State Government / ULB's finances have been strained, and they are not capable to continue with a debt-subsidization.

Economic Liberalisation

After 1991, the stream and direction of foreign direct investment (FDI) entering India has constructive shift in recent years. The flow of FDIs into the industries both directly and indirectly was created a positive impact to obtain funding to create infrastructure and be one of the biggest spenders on infrastructure and manufacturing. Certain infrastructure development sectors, including telecommunications, highways, power, and ports, as well as state-owned firms, are allowing private organizations to operate in a spirited atmosphere.

Governments at both the national and state levels are dynamically involved in managing the shift from public to private sector by developing policies and establishing institutions such as the Central Road Fund and autonomous regulatory organisations in the power and telecommunications industries. In light of the Intensive Urban Growth, the Urban Infrastructure has also been given priority for advancement and growth.

74th Constitutional Amendment Act

The emergence of economic and structural reforms in 1991 and after the enactment of the 74th Amendment Act (1992) which came into force in 1993, it was hoped that municipal finances will receive the necessary

impetus and municipal governments will gradually become financially self-sustainable and efficient. In the past two decades, various strategic initiatives have been taken targeting all tiers of government to streamline Urban Local Body / municipal finances. Hence, it is clear that prior to 74th Amendment the Municipal Finances in India have historically been in an unsatisfactory state.

With the initiative of 74th Constitutional Amendment Act, it was visioned that it will allow ULBs to perform successfully and will assist the ULBs in financing major infrastructure projects.

Table- I: Key Initiatives of the 74th Constitutional Amendment Act (CAA)

| Key Initiatives | |
|--|---|
| 1 Conferring Urban Local Bodies Constitutional Status through 74 th CAA, specifies their functional domain i.e., devolving funds, functions and functionaries to the ULBs level. | 5 Creating a constitutional framework for redesigning intergovernmental transfer mechanisms in order to improve the fiscal relationship between the Central, State, and Local governments. |
| 2 Authorizing the Central Finance Commissions to look in to needs for municipal finance. | 6 The establishment of State Finance Commissions to examine the sharing of state resources between the state and municipal bodies. |
| 3 The FIRE-D Project, funded by USAID, was successful in developing a municipal bond system. As part of the FIRE-D project, the Income Tax Act of 1961 was amended to allow municipal governments to issue Tax-Free Municipal Bonds. | 7 Under the Urban Reform Incentive Fund (URIF) and the Jawaharlal Nehru National Urban Renewal Mission, an incentive framework has been established for municipal bodies to undertake financial reforms relating to property taxes, user charges etc. |
| 4 Introduction of Pooled Finance Mechanism. | 8 Developing policy and operational guidelines for Public-Private Partnerships for augmenting and delivering municipal services. |

According to the 74th CAA, state governments devolved funds, functions and functionaries to the ULBs. As per this Amendment, for every five years the State Finance Commissions (SFCs) are to be established by the State Governments to recommend fiscal / resource transfers from the state to the latter for improving the ULBs financial position. However, The State Government has not fully devolved the funds, functions and functionaries to ULBs and the SFC's recommendations are not being implemented in toto, citing resource constraints, which undermines the very purpose of amending the 74th CAA and establishing the SFCs.

Status of ULBs Finances

Financial support from state governments is insufficient, and most of the

state governments are unable to provide adequate funding to ULBs. As a result, the deteriorating financial situation of the state governments is having a negative impact on the ULBs.

Internal revenue generation by Local Bodies, particularly through property tax and user charges, continues to be underutilised. According to the report of 13th FC, property taxes collected account for 0.16 percent to 0.24 percent of GDP, while user charges generate low revenues in India. Adding to this bare scenario, the states in India have lagged in establishing SFCs. This critical financial situation of the ULBs resulted in seeking access to debt markets.

Initiatives by the Govt for Strengthening Urban Infrastructure Finance

For the first time, the Eighth Five-Year Plan (FYP) (1992-97) emphasised recouping the cost of expense in the municipal governance. The Rakesh Mohan Report (1996) recommended for the 'commercialization of infrastructure' by commoditizing urban services, forming public-private partnerships (PPPs), and raising money through capital market. The strategy focuses on equipping municipalities to satisfy their capital investment demands using institutional finance and market mechanisms such as municipal bonds.

PPPs and capital market borrowings have both gained credibility since the launch of the FIRE (D) programme in India in 1994. The project collaborated with India's central, state, and local governments to create long-term urban environmental services and ensure that the poor have access to them.

During the Ninth Plan period (1997-2002), budgetary allocations for urban infrastructure development were significantly reduced. Instead, special funding vehicle has been established to finance various urban development programmes. These not only helped promote private financing choices, but also helped ULBs improve skills in areas including property tax reform, accounting systems, and PPP architecture and execution. To help large and small municipalities improve their financial health, credit enhancement measures such as escrow and pooled financing were advocated.

The 10th FY Plan (2002-07) was given thrust for encouraging public-private partnerships (PPPs) in urban infrastructure financing for increasing investment in upgradation of urban infrastructure. The Plan recommended (a) property tax improvement, (b) collection of user charges, (c) raising non-tax income, (d) limiting establishment expenses, (e) improved usage of municipal assets, and (f) reforming municipal accounting systems to enable ULBs to raise their own resources.

The Union Budget for 2002-2003 has first time proclaimed 'Urban Reform Incentive Fund' (URIF) with the objective of rewarding urban reforms. In addition, the budget suggested creating a Pooled Finance Development Scheme (PFDC) to provide subsidies to specified ULBs in order for them to 'access open market for borrowings through Pooled Financing Bonds for allocation of funds in the projects of urban infrastructure.

The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) was adopted in December 2005, with the government's efforts in JNNURM, the cities are on fast track to growth.

The 11th Five Year Plan (2007-12) suggested focusing on infrastructure improvement, disposal of solid waste, water supply, slum upgrading, sewerage treatment and other essential civic services and infrastructure.

The Rajiv Awas Yojana (RAY-2009) introduced incentives for the transformation of settlements and implementing PPPs in affordable housing, a large sum of money was invested to build a slum-free India.

The 12th FYP (2012-17) emphasised that with the urban sector contributing nearly 70% of GDP and population projections indicating 40% urbanisation in the future, the emphasis needed to be switched to urban development on anticipation of its all round growth.

The Union Budget (2014-15) announced the creation of a hundred 'smart cities' from the present cities to boost Indian cities' economic competitiveness. These efforts can be seen as a natural extension of JNNURM's city transformation plans. But a meagre provision of funds has been made, creating a minute impact on the development.

Smt. Nirmala Sitharaman, Union Minister for Finance, released the Task Force's Report on National Infrastructure Pipeline for FY 20-25 on April 29, 2020. Which was prepared by a High-Level Task Force led by the Secretary of the Ministry of Finance's Department of Economic Affairs (DEA). Through the National Infrastructure Pipeline (NIP) for FY 2019-2025 the government exercises to facilitate citizens with elite infrastructure, while also improving their living standards.

To reduce strain as well as to fill the demand-supply gap in infrastructure financing, a wide selection of financial instruments is made available under both public and private sector. Bonds, public-private partnerships (PPPs), privatization / divesture, infrastructure investment funds, private risk mitigation, and crowd funding are some of the private sector choices. Municipal growth funds and development banks, pooled financing, viability gap funding, risk reduction, and tax exemptions are all the choices in the public sector.

In addition to direct government assistance in the form of government funding, ULBs are permitted to borrow from the Housing and Urban

Development Corporation (HUDCO). The borrowings from the HUDCO are guaranteed by governments, which reduces the risk of the lender, as the lender was sensitized to the government's risk rather than the Project risk.

By divorcing lending from project risk, the lender's incentives were fully distorted, and the ULB's incentive to develop a successful project was likewise skewed by the knowledge that the state government bore the ultimate risk of default. The funding structure has fundamentally become sub-optimal as a result of the aforementioned weakness, paving the door for unsustainable projects.

Unfortunately, while HUDCO has done a good job of subsidising municipal debt in India, it has not focused on long-term municipal capacity development, resulting in dependency and dereliction.

Elevation of Municipal Finance as Urban Infrastructure Finance

In light of the foregoing, in rapid urbanization scenario, the term Urban Infrastructure Finance presents macro view. With various financial instruments and mechanisms, whereas the term Municipal Finance presents micro view.

The dimensions of urban infrastructure funding are as follows:

- Investing in significant infrastructure projects in major economic hubs
- Funding for the expansion of essential facilities in urban areas
- Investment finance methods based on intergovernmental agreements

The various Commissions and Committees formed by the Government suggested the possible reforms actions to improve the scope of Urban Infrastructure financing, strengthening the institutional arrangements for financial autonomy, capacity building, service delivery and public participation.

Hence, during the Phase-I and Phase-II with the changing requirements of the Urban Infrastructure Financing, the Municipal Finance with extended arms viz., New financial instruments and Innovative mechanisms, has been elevated from the traditional or conventional mechanism to Urban infrastructure financing to meet the requirements of Urban Infrastructure Development.

Types of Urban Infrastructure Financing

Initially, the financing of Urban Infrastructure was done through the mechanism of Municipal Finance, later on various financing mechanisms are emerged and developed under the umbrella of Urban Infrastructure financing. The different types of Urban Infrastructure Financing are Municipal Finances and Market Based Financing:

Table-2: Municipal Finances:The Source of Finances

| S. No. | Source of Finance | Classification of Source of Finance |
|--------|---|--|
| 1. | Tax Revenue i.e., Taxes Collected from Direct and Indirect Taxes | Property Tax including Surcharge on Property Tax. Tax on Trade, Profession Tax on Advertisement. Service Charges on Central Govt. Properties. Tax on Carriages. Tax on Carts. Tax on Vacant Land Tax on Animals |
| 2. | Non-Tax Revenue i.e., Recurring income earned by the government from sources other than taxes | User Charges Municipal Fee Sale & Hire Charges Lease Amounts |
| 3. | Grants | Plan and Non-Plan Grants from State and Central Governments |
| 4. | Assigned Revenues i.e., Assigned revenue is used to finance specific items of expenditure | Entertainment Tax Surcharge on Stamp Duty Profession Tax Motor Vehicle Tax |
| 5. | Debt | Loans borrowed for Capital Works etc., HUDCO Loan, Loan from LIC Loan from State and Central Governments Banks and Municipal Bonds. |
| 6. | Others | Sundry Receipts Law charge costs recovered Lapsed Deposits, fees Fines and forfeitures Rent on tools & plants, miscellaneous sales etc., |

Market-Based Financing for Urban Infrastructure

Next to the Municipal Finances as one of the source of financing Urban Infrastructure, another important source for Urban Infrastructure Financing is access to market-based Financing which includes various types of financing alternatives: i.e., Municipal Bonds, Pooled Financing and Public Private Partnerships (PPP).

Municipal Bonds

The Municipal Bonds have become an Important and attractive source of raising funds for ULBs for Urban Infrastructure Development as the municipal bonds hold good potential for financing infrastructure projects. Municipal bonds are of two types – one is general obligations and the other is Revenue Bonds. The Municipal Bonds generally issued by the ULBs are (1) Taxable Bonds and (2) Non-Taxable/Tax Exempt Bonds with or without State Guarantee to raise funds.

Taxable Bonds: Taxable bonds are the highest yielding debt instruments for the Government.

Non-Taxable Bonds: Tax exempt Bonds (Non-Taxable Bonds) attracts many investors because, the interest income is exempted from income tax. These provide an incentive to ULBs to improve their fiscal management.

Municipal bonds have been in use in India since 1997. Bangalore Municipal Corporation was India's first city government to issue municipal bonds which was followed by Ahmadabad, Bangalore and other cities in India. The municipal bonds lost its flavour due to loosing the investors' confidence and they were unable to raise the required sums. In 2015, the market regulator SEBI issued rules for the issuance of municipal bonds in order to resurrect the municipal bond market.

Pooled Financing

The accessibility of municipal bonds is available only for the larger and financially strong ULBs i.e., Municipalities and Municipal Corporations. But those ULBs which are medium and small in size and financially weak and to assist the small and medium sized ULBs in gaining access to financing markets and to support these ULBs, the Government of India introduced the pooled financing concept covering small projects under one umbrella. Based on the success of the concept of pooled financing model, to provide a cost-effective strategy for small and medium ULBs and to decrease borrowing costs, the Union Government established a central fund that allows capital investment to be pooled under one State borrowing umbrella.

Public Private Partnerships

The ULBs in India are struggling with the issues viz., lack of professional knowledge, red tapism, political interference, lack of access to finance and other resources, poor supply of basic services, lack of forecasting and vision of the demand and supply of the urban needs and non-devolution of funds, functions and functionaries to the ULBs in particular.

In this scenario, the PPPs are appropriate option for the infrastructure sector as it supplements the resources, enables a competitive environment, enhance efficiency and minimizes the costs. The main purpose of the PPPs approach is to attract private investments for infrastructure projects to leverage limited budget resources and improve the quality and quantity in the service delivery.

To boost the PPPs model the GoI has issued guidelines to sensitize the State Governments and ULBs to the policy and procedural issues in water supply and sewerage issues. As of now, a number of projects are successfully implemented through PPP Model.

Phase-3: The Phase of Market Economy (2015 onwards)

On 15th July, 2015 the Securities and Exchange Board of India (SEBI) has notified the framework for public issue of Municipal Debt Securities and listing and trading of such securities. Till the date of issue of notification

in 2015, Municipalities/Municipal corporations were not permitted to list in stock exchanges and trading of the bonds. Now the Urban Local Bodies have an opportunity to start off capitalizing funds for Atal Mission for Rejuvenation and Urbanisation Transformation (AMRUT) and Smart Cities Mission.

The SEBI guidelines on Municipal Bonds is an initiative to make the municipal bond market more effective and attractive. The following are the regulations:

- As part of efforts to promote fund raising by Urban Local Bodies akin to Municipal Corporations / Municipalities, SEBI issued regulations for the issuance of municipal bonds. In addition, the minimum private placement subscription amount for municipal bonds should be cut from Rs 25 lakh to Rs 10 lakh in order to bring it in line with corporate bonds.
- SEBI mandated wider disclosure and compliance norms for issuers of listed municipal bonds. Broadly, according to SEBI, listed institutions must prepare and present unaudited financial reports every six months, widened the definition of issuers and issued a structured payment mechanism through escrow accounts.
- Bond issuers will have to follow SEBI guidelines on continuous disclosure and compliance. The credit rating agency has to review the credit rating of the bond issuer at least once a year. In the occasion of downgrading of the rating the reasons for the same may be disclosed by the listed institutions and suggestions to recover the rating. Any alterations in credit rating should be timely informed to the listed stock exchanges along with half-yearly financial results, a report containing the status of implementation of project(s), reasons for their slowdown, stoppage if any, and the status of utilisation of issue proceeds for implementation of the projects.
- These regulations will allow resource-strapped ULBS (Municipalities/Municipal Corporations) across the country to access capital markets for financial resources. The rules allow for the public issuance and listing of privately issued municipal bonds, as well as obligations for potential issuers to provide certain disclosures.

Tax revenues are to be used for servicing of debt. Tax Revenues should ideally be the first charge, so that there is an assurance that funds are always available for servicing debt. There is a view that the creation of an escrow mechanism will help improve the credit worthiness of the municipal entities and will build confidence among investors to invest in the municipal bonds.

However, the stringent norms laid down by the SEBI will challenge the ULBs to be more transparent in their accounting process and help reduce the opacity in the financial information of the entities. It will bring in transparency and discipline in the financial result reporting by the entities.

The effective implementation of the SEBI-Regulations 2015 will help in

strengthening the ULBs in all the aspects and make them viable for fund raising on their financial strength, gives a new dimension to the Municipal Bonds by presenting them as effective and attractive financial instrument.

Interpretation on the Journey of Financing Urban Infrastructure

The journey of Urban Infrastructure Finance in India has progressed through the three Phases i.e., Phase of Planned Economy, Phase of Reforms and Phase of Market Economy. However, this journey has not reached the destination nor nearer to destination. This impacted on resources gap of ULBs which in turn reflected on (in) effective urban infrastructure facilities. Financing urban infrastructure in India in its journey as on date was not up to the expectations and the requirements of the market and economy.

Urban Infrastructure Financing Estimates and Status

Estimates: In 2011, the Government received recommendations from the High Powered Expert Committee (HPEC), which was constituted by the Ministry of Urban Development. According to the committee:

Over the next 20 years, an investment in urban infrastructure of Rs.39 billion (Rs.39.2 lakh crore at 2009-2010 prices) is required. i.e., in the years 2021-2031.

- 44 % of this investment requires for laying of urban roads.
- 20 % of this investment is required for water, sewerage, solid waste management, storm water drains, streetlights etc.,
- 14 % of the investment is required for transport and traffic related infrastructure.
- 10.5 % of the investment is required for Urban rejuvenation
- 2.5 % of the investment for Capacity building for effective urban governance

As per the latest ‘*National Infrastructure Pipe-line(NIP)*’ 2020 report of the Government of India: The Capital expenditure under the NIP between fiscals 2020-2025 is estimated Rs.111 Lakh Crore. Out of this, the estimated expenditure for Urban Infrastructure is Rs.19.19 Lakh Crore, which constitutes 17% of the total expenditure.

Table-3: Projected Expenditure Under Urban Infrastructure

| Ministry | FY 2020 | FY 2021 | FY 2022 | FY 2023 | FY 2024 | FY 2025 | No Phasing | FY 2020-25 (In Crores) |
|---|------------|------------|------------|------------|------------|------------|---------------|------------------------------|
| Urban | | | | | | | | |
| AMRUT, Smart Cities, MRTS, Affordable Housing, Jal Jeevan Mission | 298,174 | 462,208 | 404,134 | 234,858 | 217,164 | 159,862 | 142,867 | 1,919,267 |

Source: GoI, Report of the Task Force National Infrastructure Pipeline (2020).

Status of Grants under Central Finance Commission

Ever since the recommendations of 10th Finance Commission (10th F.C) to local bodies, the resources to ULBs have augmented (Table-4). These resources were made available to ULBs in order to improve service delivery and build key urban infrastructure.

Table-4: Finance Commission Grants for Urban Development

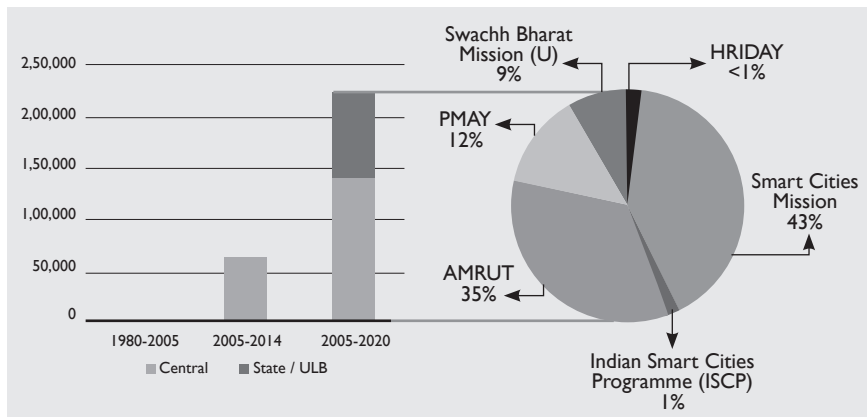
| Finance Commission | Central Grants under Central Finance Commission for Urban Development |
|---------------------|---|
| 15 th FC | Rs. 121055 Cr |
| 14 th FC | Rs. 87144 Cr |
| 13 th FC | Rs. 23472 Cr |
| 12 th FC | Rs. 4500 Cr |
| 11 th FC | Rs. 2000 Cr |
| 10 th FC | Rs. 1000 Cr |

Source: Finance Commission Reports. (10th to 15th Finance Commission Reports).

Investments into Urban Infrastructure Development under Key Programs of Government

JNNURM: The Jawaharlal Nehru National Urban Renewal Mission (JNNURM-2005) was the Central Government's flagship programme for giving financing support to urban infrastructure through several sub-missions. The initiative began with an investment of INR 66,000 crore, and since then, investment in urban infrastructure has nearly quadrupled in 2015 under Smart Cities, AMRUT, PMAY, and HRIDAY. The government has set up INR 2.24 lakh crore for the development of core and smart urban infrastructure.

Figure-I: Composition of JNNURM



Source: Yes Bank Financing Urban Infrastructure Report (December, 2017).

Municipal Bonds

A municipal bond is a financial obligation issued by a local government with the pledge to pay the bond's interest and principal on a set timetable. They can either be General Obligation Bonds, in which the principal and interest are guaranteed by the issuer's overall tax revenues, or Revenue Bonds, in which the principal and interest are guaranteed by revenues from a specific ULB project, or Hybrid Bonds, in which the principal and interest are guaranteed by a combination of both. An amount of Rs. 1383.10 Crores were raised through Municipal Bonds in India during 1997-2016.

Table-5: Funds Raised Under Various Types of Bond Instruments

| Sl. No. | Type of Instrument | Amount Raised |
|---------|--------------------|--------------------|
| 1 | Taxable Bonds | Rs. 445.00 Crores |
| 2 | Tax Free Bonds | Rs. 679.50 Crores |
| 3 | Pooled Finance | Rs. 258.60 Crores |
| | Total | Rs. 1383.10 Crores |

Source: Yes Bank Financing Urban Infrastructure Report (December, 2017).

Conclusion

Historically, investment on urban infrastructure shows a nominal picture. Serious efforts started since 1991 economic reforms. Given the enormous estimated need for urban infrastructure investment, sums of this magnitude cannot be funded solely from the budgetary support of the Central, State, and Local Governments. This scenario necessitates to pool funds from the capital market and to encourage the private sector to participate in urban infrastructure development initiatives as a policy.

As the budgetary outlays of ULBs are lower than the required investments, the gap will be filled through issuance of Municipal Bonds. Hence, to make ULBs more creditworthy and able to obtain funding from sources other than grants (via Public Private Partnerships and Capital Markets) becomes important. To build necessary urban infrastructure and to meet future investment objectives, private sector involvement and amplifying financial resources and implementation capabilities to ULBs is important.

The magnitude of investment, the time horizons involved, and the impact of pre-existing infrastructure on urban infrastructure provision necessitate a coordinated approach to forward planning, policy development, and implementation.

The policy reforms in regard to Urban Infrastructure and Financing instruments bring innovative Urban Financial models. This will be a win-win situation both to the Urban Local Bodies / Government as well as Investors. This sustainable Urban Infrastructure development will be as

per the aspirations of the public and emerging needs of the Urbanizing populations. This leads to the urban growth as well as economic growth.

Hence, the expedition of financing urban infrastructure in India is not much impressive. Due to policy, funding and implementation shortfalls, not much could be done as desired in the present economic scenario. The journey of financing urban infrastructure can be made more effective and worthwhile in the future by confiscating the shortfalls such as various policy measures, funding, implementation reforms and by effective administration. In the rapid urbanisation scenario, the concept of Financing Urban Infrastructure can be strengthened and made more effective for efficient fund raising to fulfil the needs of urban infrastructure.

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Moving from Incomplete Information to Asymmetric Information: Cross Country Analysis of COVID-19 Pandemic

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Abstract

COVID-19 pandemic is a massive global health crisis. The individual as well as the policy makers have to face various trade-offs to maximize their self-interests. Therefore, the policies should be devised in such a way to maximize social welfare and optimal delivery of public goods such as healthcare, means of livelihood, etc. The researchers have provided a conceptual framework on the given issue by discussing the whereabouts stages of *incomplete information* and *asymmetric information* during COVID-19 which can lead to market failure. Through multiple regression analysis, the models are prepared by researchers to study various parameters such as total cases, life expectancy, hand-washing facilities, testing, *age older* (70-year, 65-year & median age), *hospital beds*, GDP per capita, etc. to evaluate the total number of deaths of COVID-19 patients in the sample countries.

Keywords: Aged Older, Asymmetric Information, COVID-19, Hospital Beds, Incomplete Information

Introduction

At the onset of December 2019, COVID-19 a novel virus has started affecting the large chunk of the population. Several guidelines are regularly raised to combat the effect of COVID-19 and decrease the social costs in the system. The researchers, scientists, pharmaceutical community are in

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full swing to develop a vaccine or adequate medicines to free the world from the shackles of COVID-19 (Callaghan, 2020).

An overview of the dynamic of the COVID-19 outbreak was discussed in earlier studies (Gabutti et al., 2020). The insurgence of asymmetric information and incomplete information could be visualized with the increase in discrepancies in information dissemination. The rate of morbidity is in direct proportion to diabetes, heart problems, deficiency, less immunity, etc. (Cockerham et. al., 2017). After the span of ten months, one has reached the stage of asymmetric information and the motive is to reduce the asymmetric information and move forward towards symmetric information / complete information (Tandon, 2020).

In the study, the researchers have first discussed the problem of incomplete information which might lead to market failure. The transition from incomplete to asymmetric information could be seen after various research studies conducted by the scientific community, researchers, etc. This study attempts to verify the directional relationship of total deaths with total tests, total cases, hospital beds, handwashing facilities, new cases, GDP Per Capita, Life expectancy and age group in the sample countries. Given this backdrop, it is pertinent to devise optimal and efficient policies and guidelines to combat the effect of Pandemic. A proper mechanism needs to be developed by all the Governments of countries to balance the trade-off between 'Competition' and 'Collaboration'. This could be done by having a robust social security network, proper healthcare facilities, adequate measures of social distancing, quarantine, lockdown etc.

Incomplete Information Versus Asymmetric Information

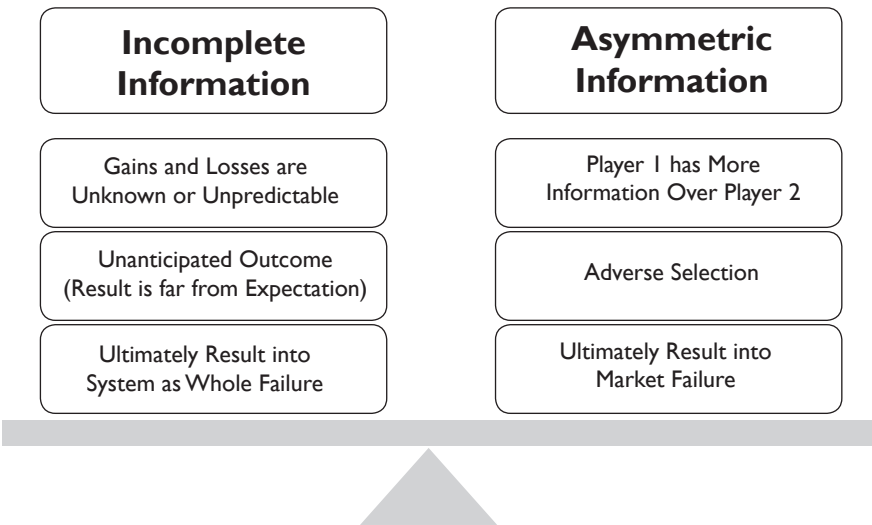
The world is going with unresolved challenges due to COVID Pandemic, though, the scientists and research community are intensively working on the early resolution. There are clinical trials going on vaccine development with advanced planning. It is known that the virus spreads from one infected person to another through the droplets (such as sneezing, coughing, talking etc.). According to some experts to prevent oneself from getting infected at least 6 feet (1.8 m) or 2 metres distance is required. The rate of transmission of the virus is directly proportional to the size of it. Also, the weather conditions such as high humidity or the use of Air Conditioners accelerate the process of transmission (Vuorinen et al., 2020; Jones et al., 2020; Ketchell, 2020 & Biryukov et al., 2020). However, despite the effect of COVID-19 from December 2019, little is known about the nature of the virus and the people are continuously getting infected by it.

Moreover, the initial two-three months, a maximum of us were in a stage of incomplete information, where the expected loss of pandemic was unknown. Therefore, the global community has faced an unanticipated

outcome, where the results were far from the expectation. This phenomenon of incomplete information adversely affects the system and impedes the functioning of the same. Therefore, during the incomplete information phase, the appropriate measure to minimize the unanticipated harm / cost was to impose lockdown or pause, so that additional information can be gained in due course of time and reach the stage of asymmetric information. It will minimize the unanticipated cost or harm inflicted on the society (Tandon, 2020 & Cepoi, 2020).

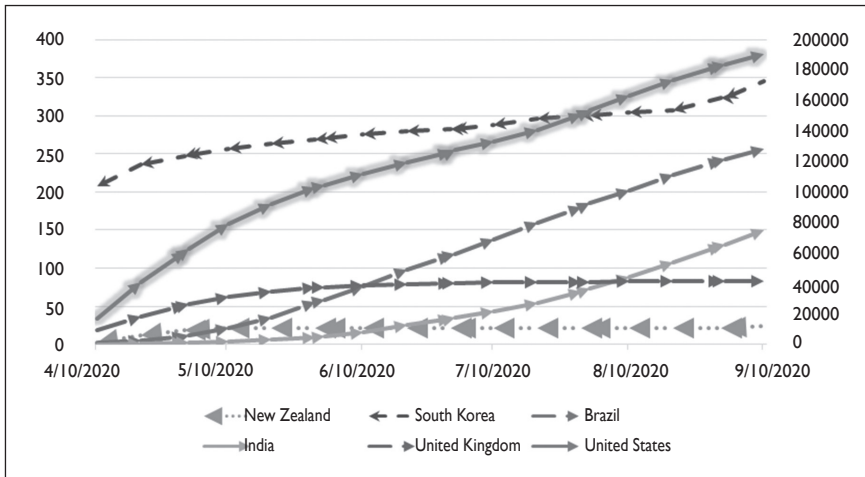
The world community moved from the stage of incomplete information to that of asymmetric information, where the research community (Player 1) has more information over the public at large (Player 2). Though, there is no monetary gain about sharing information (Goodell & Huynh, 2020). But due to ongoing research or early-stage outcome, the result may vary in the later stage. They are not in a position to provide the existing information. Therefore, people may make an adverse selection out of ignorance or by chance. This may result in unexpected harm to individuals and due to the known contagious characteristic of COVID-19, it might spread in the society as a whole and be responsible for a market failure. Market failure will be for the whole system wherein there will be rise in total deaths, influx of new cases, chronic infections etc.

Figure- I: Incomplete Information Versus Asymmetric Information



Economics might aid in comprehending the above-discussed scenario as that of Incomplete Information where the social costs are raised exponentially and the whole system comes on the verge of failure.

Figure-2: Total Deaths (COVID-19) (1/4/2020 to 10/9/2020)



Primary Axis (New Zealand, South Korea); Secondary Axis (USA, Brazil, India, UK)

Source: OurWorld in Data (University of Oxford- Oxford Martin Programme on Global Development)

Figure-2, reflects that South Korea had controlled the adverse effect of pandemic through a robust system of tracing and testing while New-Zealand, having less population was in months of lockdown. Therefore, one can see that South Korea proves to be an optimal model in combatting COVID-19 without a lockdown, due to the increased information available to the citizens of South Korea (Thakkar, Rami & Agarwal, 2020).

The role of complete information allows an individual to make an informed decision and calculate the opportunity costs and facilitate a Cost-Benefit Analysis of Individual rights and Prospective damages to the system as a whole. Therefore, the Government should come out with optimal policies to regulate the social costs raised by COVID-19 (Thakkar, Rami & Agarwal, 2020).

There are various factors which lead to increase in total number of deaths due to COVID-19. At the macroscopic level, countries which have the population of higher age group (above 70 years old) are more prone to have chronic COVID-19 infections. This is because of low immunity present and prevalence of old-age diseases. Similarly, the countries having high life-expectancy rate will also witness more chronic infections and number of deaths due to COVID-19 as compared to countries who have majorly young population. The degree of the adverse effects due to COVID-19 further depends on the socio-economic, demographic conditions prevalent in the country. In unprecedented times of COVID-19, it is observed that a problem of free-rider exists. An example of free-rider can be where few persons are wearing masks and getting quarantined to protect themselves while the others are not taking adequate precautions and thereby taking

advantage of the precaution taken by others (Falk & Hagsten, 2020). Another major issue is the presence of asymptomatic persons which raises the risks of other individuals (Buheji & Buheji, 2020). Thus, to effectively combat COVID-19 it is very important to have complete information and awareness by not being indifferent to reduce the total number of deaths due to COVID-19.

Methods

The researchers have applied law and economics framework and identified various variables from 210 sample countries. This cross-sectional data reflects the one point or period of time/date, i.e., September 8, 2020. In this study, the Total deaths per million due to COVID-19 is taken as a dependent variable which is dependent on a number of variables such as Total cases of COVID-19 per million, total tests of COVID-19 per thousand, hospital beds per thousand, new cases, handwashing facilities, sanitisation facilities and people of old age (70 years, 65 years and median age).

Data Description

The study intends to measure directional relationship between Total Deaths of COVID per million as the dependent variable with the Total Cases of COVID-19 per million, New Cases of COVID-19 per million, Total Tests of COVID-19 per thousand, Aged 70 years / Aged 65 years / Median Age, GDP Per Capita, Hand Washing Facility, Hospital Beds per thousand and Life Expectancy as independent variables. This directional relationship was measured through multiple linear regression model based on data of September 08, 2020.

The data of identified dependent variable and independent variables are of 210 sample countries from the Our World in Data (University of Oxford-Oxford Martin Programme on Global Development). This study is based on cross-sectional data. It reflects the situation COVID-19 as of September 08, 2020. However, the data before the sample date or after date do not significantly change the directional relations between dependent variable with independent variables as stated in Table-1.

The problem of multicollinearity was tested using Variance Inflation Factor (VIF) value. In the estimated models, the problem of multicollinearity was found in the Aged 70 years, Aged 65 years and Median Age in their estimated value of VIF, when these three variables were estimated in the one multiple regression model. Therefore, the three separate regression models were estimated, where the aged 70 Older, the aged 65 Older and the median age were separately taken as an independent variable, with same the combination of dependent variable and independent variables to verify direction relation and VIF Value. The best combination of linear model

was identified based on significant value and absence of multicollinearity and other econometric properties along with suitable diagnostic tests.

In the three estimated models; problem of multicollinearity was not found as the estimated value of VIF is less than 3. In the data, there were few missing values in some of the selected independent variables. Such missing values were filled with mean values of respective variables to avoid the issue of missing observations. It is important to note that in all models, residuals were not normally distributed and due to a cross country data with a large variation and to the size of the country; problem of heteroscedasticity was found.

Results

The directional relationship between Total Deaths of COVID-19 per millions as dependent variable with sets of independent variables, as stated in the Table-1.

Table-1: Multiple Linear Regression Results

| Total deaths per million due to COVID-19 (Dependent Variable) and Independent Variables, as follows | Coefficients (Sig.) [VIF] | Coefficients (Sig.) [VIF] | Coefficients (Sig.) [VIF] |
|--|--|--|---|
| Constant (a) | -158.698 (0.317) | -186.951 (0.238) | -413.445** (0.007) |
| Total cases of COVID-19 per million (b1) | 0.021*** (0.000) [2.029] | 0.021*** (0.000) [2.042] | 0.020*** (0.000) [1.976] |
| New cases of COVID-19 per million (b2) | -0.297** (0.037) [1.695] | -0.302** (0.034) [1.696] | -0.289** (0.050) [1.695] |
| Total tests of COVID-19 per thousand (b3) | -0.176 (0.171) [1.441] | -0.176 (0.172) [1.442] | -0.204 (0.127) [1.437] |
| Age Older (b4) | 17.750*** (0.000) [2.647] {70 Year} | 11.502*** (0.000) [2.701] {65 Year} | 3.631 (0.130) [3.922] {Median Age} |
| GDP Per Capita (b5) | -0.002** (0.039) [2.714] | -0.002** (0.035) [2.727] | -0.002** (0.035) [2.873] |
| Hand washing Facility (b6) | -0.462 (0.421) [1.483] | -0.583 (0.310) [1.465] | -0.991* (0.096) [1.471] |
| Hospital Beds per thousand (b7) | -14.944*** (0.008) [1.491] | -14.274** (0.012) [1.488] | -8.485 (0.149) [1.517] |
| Life Expectancy (b8) | 2.908 (0.261) [3.775] | 3.323 (0.200) [3.750] | 6.425** (0.020) [3.934] |

| Total deaths per million due to COVID-19 (Dependent Variable) and Independent Variables, as follows | Coefficients (Sig.) [VIF] | Coefficients (Sig.) [VIF] | Coefficients (Sig.) [VIF] |
|--|----------------------------------|----------------------------------|----------------------------------|
| Adjusted R square | 0.432 | 0.425 | 0.386 |
| Model Specification Test (F-test) | 19.082 (0.000) | 18.607 (0.000) | 15.770 (0.000) |
| Multicollinearity (Based on VIF - Test) | No | No | No |
| Autocorrelation# (Based on Durbin – Watson Test) | 1.95 No | 1.96 No | 2.02 No |
| Residual Normality (Based on Kol-mogorov –Smirnov Test) | 0.175 (0.000) No | 0.176 (0.000) No | 0.224 (0.000) No |
| Heteroscedasticity (Based on Brush – Pagan Test) | 11.371 (0.000) Yes | 11.310 (0.000) Yes | 15.368 (0.000) Yes |

Note: *** represent significant at 99% confidence level, ** represent significant at 95% confidence level and *represent significant at 90% confidence level.

value of the Durbin-Watson Statistics is around 2, hence there is no autocorrelation. Besides, it also indicates that the set of independent variables are really meaningful in explaining significant amount of variations in dependent variable.

The following hypothesis is tested using the model:

Ho – Non-linear Model

H1 – Linear Model

The result of ANOVA test provides the estimated value of F statistics of all the countries associated with the p value (0.000) demonstrates that the null hypothesis (Ho) is rejected at 99% confidence level. Hence the model of all the countries taken above is correctly specified. It also suggests that the selected independent variables are important and meaningful in explaining variations in the dependent variable. On the basis of Adjusted R square value 43.2%, 42.5% and 38.6% variations in total deaths per million across the globe due to COVID-19 is together explained by aged 70 years older, aged 65 year older and median age respectively; along with set of all other independent variables.

The following equation can be derived from the summary of the model in table:

Total deaths per million = $a + b_1$ (Total cases per million) + b_2 (New cases per million) + b_3 (Total tests per thousand) + b_4 (Aged 70 year older/Aged 65 year older/Median Age) + b_5 (GDP Per Capita) + b_6 (Hand washing Facility) + b_7 (Hospital Beds per thousand) + b_8 (Life Expectancy)

On substituting the value, the equation changes to:

Total deaths per million = $-158.698 + 0.021$ (Total cases per million) - 0.297 (New cases per million) - 0.176 (Total tests per thousand) + 17.750 (Aged 70 Year Older) - 0.002 (GDP Per Capita) - 0.462 (Hand washing Facility) - 14.944 (Hospital Beds per thousand) + 2.908 (Life Expectancy) ... (1)

Total deaths per million = $-186.951 + 0.021$ (Total cases per million) - 0.302 (New cases per million) - 0.176 (Total tests per thousand) + 11.502 (Aged 65 Year Older) - 0.002 (GDP Per Capita) - 0.583 (Hand washing Facility) - 14.274 (Hospital Beds per thousand) + 2.908 (Life Expectancy)
... (2)

Total deaths per million = $-431.445 + 0.020$ (Total cases per million) - 0.289 (New cases per million) - 0.204 (Total tests per thousand) + 3.631 (Median Age) - 0.002 (GDP Per Capita) - 0.991 (Hand washing Facility) - 8.485 (Hospital Beds per thousand) + 6.425 (Life Expectancy)
... (3)

Though the coefficient of Median Age, i.e., 3.631 (in equation no 3) turns out to be statistically insignificant, but the same are i.e., 11.502 (in equation no 2) and i.e., 17.750 (in equation no 1) is statistically significant at 99% confidence level respectively. It can be seen as it is gradually higher in respective equations. This indicates that as age increases; the intensity of deaths due to COVID-19 is also expected to increase substantial and significant.

Thus, one can make the following inferences -

Increase in Total cases per million and aged 70 older and 65 older will significantly increase total deaths per million due to COVID-19. However, the beta coefficient value is higher of 70 age older in comparison with 65 age older.

Increase in New cases per million and GDP Per Capita will significantly reduce Total deaths per million due to COVID-19. Also, the Hospital Beds per thousand will significantly reduce Total deaths per million based result of two equations.

Increase in Life expectancy will increase Total deaths per millions due to COVID-19 though its coefficient is statistically insignificant in two equations.

Total tests per thousand reduce the Total deaths per millions due to COVID-19 though its coefficient is statistically insignificant.

Hand washing facility will help to reduce deaths due to COVID-19 though its coefficient is statistically insignificant in two equations.

Elderly people have higher mortality compared to the younger ones.

However, it is expected that intensity/magnitude may differ for data on different dates and for different countries when a country specific analysis is performed but the direction in variations of independent variables will be constant.

Discussion

Based on regression analysis, it becomes expressly clear that certain parameters are essential for a reduction in Total deaths per million due to COVID-19 cases.

More cases will lead to more deaths due to COVID-19. Hence social

distancing, wearing masks, immunity booster, and other precautionary measures which help in reduction in cases will help to reduce deaths due to COVID-19.

The primary objective of the governments of the countries should be to flatten the COVID-19 curve. This is possible when the total cases per million are reduced. Various measures are taken by the governments of several countries such as, to control the management and cause deterrence India invoked Epidemic Diseases Act, 1897 and Disaster Management Act, 2005. The measures taken by the USA were quite late and recklessness can be observed on the part of combating the virus. Later, USA invoked the Immigration and Nationality Act, 1965 and Public Health Services Act, 1944. To combat the virus South Korea primarily used three legislations-Infection Disease Control and Prevention Act, 2009, Medical Services Act, 2007 and Quarantine Act, 2008. New Zealand has adopted a stricter sense of the Pigouvian Model and has primarily invoked Health Act, 1956 and has amended the COVID-19 Public Health Response Act in 2020. Brazil had a robust public health infrastructure due to its previous experiences with the virus and has primarily used the Quarantine Act. Several countries such as India, New Zealand, USA, Santa Catarina and Sao Paulo in Brazil have imposed lockdown partially or in localized areas for months to decrease the transmission rate of the virus.

The data clearly reflects that one needs to take care more of the aged people particularly above 70 years old and 65 years old as they have a higher probability of being infected. The governments of various countries are coming up with guidelines to reduce the mobility of the people of this age-group outside their homes. Also, they have asked households to take extra due care and adequate precaution to their near and dear old aged family members.

As the number of people getting infected is more, it is required that sufficient number of hospital beds per thousand population is available. The hospitals should be well-equipped with facilities such as Intensive Care Unit (ICU), Ventilators, Oxygen cylinders along with skilful doctors, anaesthetics, nurses and staff. There is an inverse relationship between deaths due to COVID-19 and health infrastructure. There is a requirement that adequate health infrastructure based on size, old age, and other scientific parameters is established.

Sanitizer facilities or handwashing facilities help to develop respiratory hygiene. It kills viruses so that it does not spread to our eyes, ears, nose etc. Therefore, an adequate sanitizer facility does help us to combat the COVID-19 virus. Also, there is an inverse relationship between deaths due to COVID-19 and sanitizer/handwashing facility. There is a requirement of adequate sanitizer facilities in all the countries.

In the new case, the adequate health infrastructure and additional knowledge about the virus may have improved the probability of saving

individual life. Whereas, the better life expectancy countries might have faced negative externalities or greater risk due to the ageing population, which may require adequate due care and precaution, so that they are not being infected.

More testing helps in early detection, home isolation and quarantine will help to reduce deaths due to COVID-19. However, testing people is not a one-time task but it has to be done regularly. As there exists a high probability that a person earlier tested negative can turn COVID-19 positive a few days after. This leads to the problem of asymmetric information as another individual is not aware of the whereabouts of the infected person. This decreases the accuracy of estimating the opportunity costs and might raise social costs. Thus, to prevent this a testing centre in each community or testing kit in each household free of cost could be installed. The government might act as a body to keep a check on the third-party distributors of the testing kits. This will eradicate the privacy problems and will help in generating mutual trust (Singer, 2020). South Korea is an epitome to expound the efficacy and utility of a robust mechanism of trace and testing. The Government of South Korea used to send alert SMSs to the people disclosing information about the confirmed cases and their trajectory if it's available. It also installed walk-in booths to facilitate rapid testing. A new diagnostic system was used which can detect COVID-19 in less than six hours which was time and cost-effective in the long-run. Also, it was wise on the part of the Government to bear the costs of research and medical technology as compared to the costs ascertained due to viral infection.

Hence social distancing, wearing a mask, immunity booster and other precautionary measures which help in reduction in cases will help to reduce deaths due to COVID-19. Also, increasing testing will reduce deaths due to COVID-19. More testing helps in early detection, home isolation and quarantine will help to reduce deaths due to COVID-19. Also, in the situation like COVID-19 emergency, to combat unexpected harm due to incomplete information, the policy of, imposing lockdown will reduce deaths due to COVID-19. A lockdown policy will help to reduce the gathering of people. Wherever possible work from home, digital transaction and deliveries, etc., should be promoted. Cyclic lockdown policy could be implemented, to help economic activities to be functional and this might also, allow to improve herd immunity (Karin et al., 2020). Therefore, the above-stated measure provides additional information to comprehend the underline problem of COVID-19 pandemic and allow the systematic move from the stage of incomplete information to that of asymmetric information. Later on, due to the involvement of all scientific community / warriors, the world may accomplish the position of complete information. Thus, the policies made by the Government should be in a way where Marginal Benefits outweigh Marginal Costs.

Conclusion

The Government has devised many policies to mitigate the effect of COVID-19. The problem arises when there exists a plethora of incomplete information which in turn might lead to market or system failure. The researchers have analysed the data through multiple-regression analysis and has come to the conclusion that taking adequate measures such as rapid testing, lockdown, quarantine facilities, hand-washing facilities, and higher GDP per capita will reduce the morbidity rate. The various studies conducted earlier and the study reflects that in the span of ten months from December 2019 till September 2020, we have covered the path from incomplete information to asymmetric information.

It is, however, disappointing to note that despite the effect of the Spanish Flu in the early 20th century, the public indifference is a pertinent factor to raise the social costs. The policymakers should therefore make policies to disincentivize the individuals from being ignorant and indifferent towards the Pandemic. The need for personal precautions as expounded by this study is quite paramount in decreasing the morbidity rate.

The COVID-19 pandemic has further, created a scenario where the government and the people have to choose between the operation of a full-fledged economy or ways to save a life. The presence of negative externality in the system is the root cause of the problem and has to be efficiently dealt with. The mitigation of the COVID-19 pandemic will be possible if a situation of complete or symmetric information is reached. This will decrease the social costs and maximise social welfare.

In the Post-COVID-19 world, one can think of setting up an international organization of epidemiologists or researchers so that in the future the intensity of incomplete information is reduced and the problem of asymmetric information doesn't arise where one group is at a higher vantage point than others (Nagar, 2020). This will enable one to move forth with the object of symmetric information and reduce the ex-ante costs for future-pandemic.

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The Road Not (To Be) Taken: An Assessment of India's Ethanol Blending Program

Aachman Shekhar*

Abstract

This article analyses the likely effects of India's ethanol blending targets and the selected production routes for meeting such ambitious targets on the biosafety and food security of the country. It first analyses India's Ethanol Blending Program, as espoused in a 2021 report of the NITI Aayog. It identifies grain-based distilleries and molasses-based distilleries as the primary sources selected by the NITI Aayog to meet the increased demand of ethanol. It then undertakes an macro-economic analysis of the proposals for producing Ethanol through these sources. It is submitted that per NITI Aayog's proposed program, most of India's ethanol will be produced through molasses-based distilleries. The article highlights the several problems with increasing the installed capacity of molasses-based distilleries, and demonstrates the biosecurity and food safety ramifications. It then concludes with suggesting two alternate strategies to better harness the benefits of Ethanol without paying the heavy costs associated with the current version of India's Ethanol Blending Program.

Keywords: Biosecurity, Electronic Vehicles, Ethanol Blending, Food Safety India

Introduction

The benefits of Ethanol are many. It can help India achieve energy security and help it transition into a thriving low-carbon economy. It can also enable local enterprise and generate economic and employment benefits for India, while protecting the environment. To reap these benefits, the Indian government introduced the National Policy on Biofuels, 2018, wherein biofuels like Ethanol would be given the right impetus to be developed locally and used for fuel purposes.

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Under the policy, the Government introduced the Ethanol Blending Program, which aimed to achieve 20% blending of Ethanol in petrol by 2030. So far, so good. Recently, however, the government preponed the proposed deadline of the 20% blending by five years, i.e., from 2020 to 2025. Consequently, the country will have to boost its ethanol production capacity by manifold immediately. To meet such increased demand, the government has chosen to go the way of food-based feedstock to produce Ethanol. This article deals with the likely effects of this selected method of ethanol production on the biosafety and food security of India.

Part 2 of this article analyses the Ethanol Blending Program of India, as proposed in the 2021 report of the NITI Aayog. It identifies the important takeaways from the program that will enable the reader to understand the predominant method of ethanol production as envisaged by the program.

Part 3 then analyses the proposals for producing Ethanol through grain-based distilleries and molasses-based (sugar-based) distilleries. Upon undertaking an economic analysis of both of the proposed methods, the author submits that it is unlikely that the government will meet the high targets set for grain-based distilleries due to several geographic and production factors. It is then submitted that as per the program, a sizable portion of Ethanol will be produced through molasses-based distilleries.

Part 4 of the article highlights the several problems that increasing the installed capacity of molasses-based distilleries will lead to. The Biosafety implications of the increased use of sugar to produce Ethanol, and the consequent increase in sugar mill effluents, are demonstrated. Scientific reports are relied upon to show the deleterious effects that such increased effluents will have on the biodiversity of the nation, as well as human health. Additionally, the article demonstrates the food security challenges that may arise due to the increased production of sugarcane required for the molasses-based distilleries.

Part 5 of the article analyses two policy strategies that can be used to prevent the deleterious effects of sugar-based ethanol production without compromising on the benefits that the use of Ethanol provides. The article then recommends the government to reconsider its selection of ethanol production methods and plan for the long-term rather than rushing an inadequately designed ethanol blending policy.

Ethanol Blending Program in India

The National Policy on Biofuels, 2018 set the target of achieving 20% blending of Ethanol in petrol, i.e., 20 litres of Ethanol to be blended with every 80 litres of Petrol, by 2030. In December 2020, however, the Government of India preponed the earlier 2030 deadline to 2025 for achieving the 20% ethanol blending. The NITI Aayog recently released a

report, entitled 'Roadmap for Ethanol Blending in India 2020-25', which included an annualised 'roadmap' for the production and supply of Ethanol for every year between 2021 to 2026, along with proposals for nation-wide marketing programs for encouraging the use of Ethanol.

The important takeaways from the report are as follows:

Projection of Ethanol Demand and Supply

The NITI Aayog report estimates that India's requirement for Ethanol will increase from 173 crore (1.73 billion) litres in 2019-20 to 1,016 crore litres in 2025-26, given the 20% blending target. This estimation has been done based on the expected growth of vehicle population in India, and the Report has framed its recommendations by taking 'optimistic' projections in mind. It is important to note that these figures only represent the projected ethanol demand for petrol-blending purposes and do not take into account the other uses of Ethanol. This indicates an almost 6x (six times) increase in ethanol demand for blending purposes in 6 years.

To meet such increased demand, the production of Ethanol will have to be raised from 684 crore litres in 2019-20 to 1,500 crore litres in 2025-26. This indicates that the government plans to increase the ethanol supply by more than 2.5x (two and a half times) in 6 years. Consequently, the report proposes to increase the current production of 426 crore litres derived from molasses-based distilleries and 258 cr. litres from grain-based distilleries to 760 crores from molasses-based distilleries and 740 crores from grain-based distilleries in less than half a decade.

How it plans to achieve such a manifold increase in supply will be a critical part of this article's inquiries in the forthcoming sections.

Incentives for Ethanol Production

The report notes that the government introduced a differential pricing policy in 2018-19. Higher prices were offered to sugar mills to produce Ethanol from B-heavy molasses and sugarcane juice. This differential pricing policy greatly incentivizes sugarcane-based ethanol production.

It also notes that while sugarcane-based ethanol production may be the most economically beneficial, it can also severely impact India's water table. One litre of Ethanol from sugarcane/sugar requires around 2,600 litres of water to produce. Such high-water costs can significantly affect the availability of water for non-ethanol production purposes, as will be analysed in the forthcoming sections of this article.

Expediting Regulatory Clearances

The report notes that ethanol production plants require several environmental clearances before they can start operating or expand the production capacity of existing plants. The report recommends that the process of obtaining such clearances should be expedited by undertaking

measures, including expediting the issuance of state governments' consent to establish the required distilleries. Additionally, it recommends the creation of a single-window system by the Department for Promotion of Industry and Internal Trade (DPIIT) to allow for speedy clearances for new projects and the expansion of existing ones.

Other takeaways include 1) Ethanol Blending Roadmap, including measures to first introduce E10 fuel and then, E20 fuel in a phased manner; 2) Roadmap for production of Ethanol Compatible Vehicles, including ensuring production and availability of E20 compliant material and rollout of E10 and E20 tuned engines; 3) Unrestricted movement of denatured Ethanol, which envisages complete control over the movement of denatured Ethanol to be with the Central government to ensure unrestricted movement of denatured Ethanol across the nation. While very important from the perspective of the implementation of the Ethanol Blending Policy, these three takeaways are not very relevant to the inquiries of this article, unlike the three discussed before.

Equipped with a broad understanding of what the proposed objectives of the Ethanol Blending Policy are, and how the government seeks to achieve them, we can now delve into the numbers behind these objectives to determine the potential impact of these policies on Indian biosafety and biosecurity.

Economics of the Program

Increasing the ethanol production capacity from 684 crore litres to 1500 litres in less than six years raises an important issue concerning the viability of the Ethanol Blending Policy in India. As noted before, the report has proposed increasing the current production of 426 crore litres derived from molasses-based distilleries and 258 crore litres from grain-based distilleries to 760 crores from molasses-based distilleries and 740 crores from grain-based distilleries in less than half a decade. It becomes pretty evident that this report focusses on food-based feedstocks, including both molasses and surplus grains, as the primary source for producing Ethanol in the country.

To this effect, the Cabinet Committee on Economic Affairs (CCEA), in its meeting dated 30th December 2020, approved a note of the Department of Food and Public Distribution (DFPD) for extending financial assistance for producing first-generation (1G) ethanol from feedstocks such as cereals (barley, corn, rice, sorghum, and wheat), sugarcane, sugar beet, etc.¹

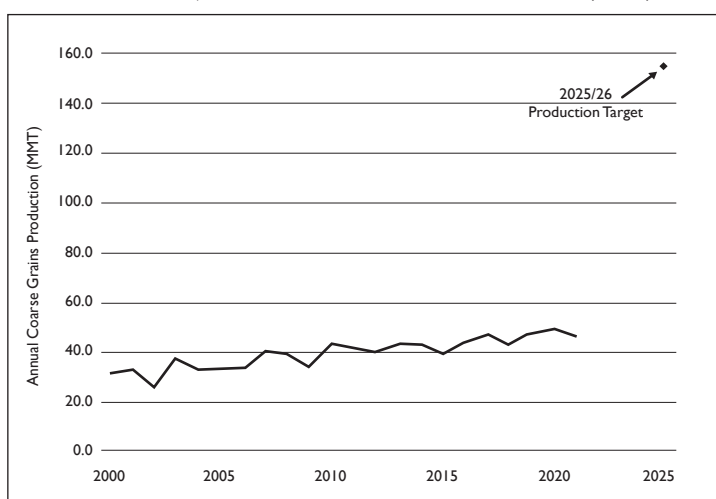
1 The Department of Food & Public Distribution notified a modified scheme to enhance ethanol distillation capacity in the country for producing 1st Generation (1G) ethanol from feed stocks such as cereals (rice, wheat, barley, corn & sorghum), sugarcane, sugar beet etc. Accessed from <https://pib.gov.in/PressReleasePage.aspx?PRID=1688616>.

Grain-based Distilleries

Despite the several challenges that India has faced in the past in meeting its ethanol blending rates, the 2025 target forecasts an ample supply of Ethanol through food-based feedstock. However, these objections are beyond optimistic since the steep increase in sugarcane and coarse grains (including barley, corn, millet, and sorghum) production needed over the next four years to meet the projected ethanol demand is highly improbable and seemingly unattainable.

The following figure gives a sense of the steep increase required in coarse-grain production to meet grain-based ethanol demand.

Figure-1: Present and Projected Annual Coarse Grain Production (MMT)



This chart makes it clear that the increase in production of coarse grains required for taking the current 258 crore litres capacity of grain-based distilleries to 760 crore litres capacity is highly improbable. The NITI Aayog report is also silent on how the government can increase the production capacity to meet the projections. These factors lead the author to believe that the government will not be able to achieve its grain-based distilleries target by 2025-26. Consequently, the government will have to rely on other ethanol production methods, mainly molasses-based distilleries, to meet the significant portion of the ethanol demand.

The report contends that FCI (Food Corporation of India) Rice, which is abundantly available in the country, can be used to make up for the shortage in supply of the other coarse grains. However, it is highly unlikely that rice ethanol production can be ramped up to the projected levels for 2025 during the remaining four-year time frame. In 2021, the government allocated a mere 78,000 tonnes of FCI rice for ethanol production, which

is equivalent to roughly 0.4% of 2025 ethanol demand, opposed to the 2,66,00,000 tonnes that the report proposes to procure and process.

Molasses-based Distilleries

Molasses-based distilleries produce Ethanol by extracting molasses from sugarcane, which is then processed to produce Ethanol. Consequently, molasses-based distilleries work in conjunction with sugar mills since sugarcanes are typically processed in these mills and are also made available for the distilleries. In 2017-18, the installed capacity of molasses-based distilleries in India was roughly 278 crore litres. By undertaking several financial incentive schemes (including interest subvention), the government has aided the creation of 31 new molasses-based distilleries projects, which have increased the installed capacity by 102 crore litres, i.e., the current installed capacity in India is 426 crore litres.

The report also notes that there are several such projects in the pipeline, which will take the installed capacity to 519 crore litres by March 2022, upon completion. The government has also undertaken several other schemes, and it is expected that these will further add 400 crore litres to India's installed capacity by 2024.

Such an emphasis on boosting the installed capacity of molasses-based distilleries (to the tune of around 912 litres by 2024) makes it clear that the government has recognised molasses-based distilleries as the likely primary source for meeting the ethanol demand of the nation. Such juxtaposition is also supported by the NITI Aayog report, given its emphasis on increasing the installed capacity of such distilleries and suggesting several measures to that effect. Moreover, the proposals for boosting production through molasses-based distilleries are significantly more concrete when compared to the recommendations for increasing the production capacity of grain-based distilleries. These factors reveal the government's first preference for the production of Ethanol, i.e., molasses-based distilleries.

To do so, the report suggests that 550 lakhs metric tonnes of sugar be diverted to the production of Ethanol by 2025-26, as opposed to the 150 lakhs metric tonnes of sugar currently being used for the production of Ethanol. Hence, the emphasis on molasses-based distilleries will require the production of an additional 400 lakhs metric tonnes of sugar. This, as will be demonstrated in the further sections, can have significant repercussions.

As is evident from the previous sub-sections, the government's primary focus for the production of Ethanol is distilleries using food-based feedstock, more particularly molasses-based distilleries. This focus on food-based feedstock in the NITI Aayog report is a significant departure from the Ethanol Blending Policy that India's Union Cabinet adopted in 2018. The 2018 policy prioritized second-generation (2G) feedstocks,

which rely on non-food biomass, such as leaves and stalks, to produce Ethanol and deliver its significant benefits without distorting food markets or the biosecurity of the nation. Food-based feedstock was also envisaged in this initial policy, but it was to supplement 2G-feedstock instead of completely subverting its use.

In the following section, we will look at the potential ramifications of this shifted focus and how it may endanger the food security and biosafety of the nation.

Biosafety and Food Security Implications of the Ethanol Blending Policy

As noted in the previous section, the ethanol blending policy adopted as per the NITI Aayog report focuses on food-based feedstock, and specifically on molasses-based distilleries, for meeting the increased ethanol demand in the years to come. Ethanol can produce significant benefits for the Indian economy and can also help reduce the amount of vehicular pollution. However, these benefits can be overshadowed by the potential harms that specific ethanol production methods, including molasses-based distilleries, can cause. In the Indian context, the increased installed capacity of molasses-based distilleries will have two grave ramifications: a) Greatly increase the discharge of Sugar Mill Effluents, which will, in turn, pollute land and water, and b) Threaten India's Food Security. The following sections discuss these two ramifications in detail.

Manifold Increase in Sugar Mill Effluents

The NITI Aayog Report proposes that 550 lakh metric tonnes of sugar be diverted to ethanol production by 2025-26, compared to the 157 lakh metric tonnes currently used. This means that the sugar industry will have to increase its production capacity by more than three times (3x) to achieve the production requirements, by establishing new factories and expanding existing ones. Moreover, the Government has also proposed making the process of getting environmental clearances very simple for such mills and associated distilleries – which means that no additional burdens would be imposed on these mills and distilleries to reduce their wastage or to treat their waste correctly. A culmination of these factors leads the author to conclude that the effluents and wastewater that the sugar mills will release will increase manifold in light of the increased production.

Such an increase in sugar mill effluents and wastewater will degrade the environment around us, affect the water we use, the air we breathe, and the soil we live on. Both scientific reports and anecdotal evidence reveal that sugar mill effluents emit an obnoxious odour and an unpleasant colour when they are released into the environment without proper treatment.

Furthermore, these effluents contain various contaminants, including chloride, sulphate, phosphate, magnesium, and nitrate, which can together cause severe harm to the environment. It has also been reported that these contaminants can also be highly harmful for plants, animals, and humans alike.

An average of 30,000 to 40,000 litres of effluents is generated for every sugar processed ton. These effluents contain a significant concentration of suspended solids, dissolved solids, a high Biochemical Oxygen Demand (BOD), high Chemical Oxygen Demand (COD), considerable amounts of chloride, sulphate, phosphate, magnesium, nitrates, calcium, and sugar concentration. Further, for mills with an attached distillery, the numerous distillation processes produce a highly contaminated effluent with Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) concentration of about 40,000 – 100,000 mg/L, also called silage. Such a high concentration of BOD and COD in water can likely build up organic matter content in waterways, leading to oxygen depletion and drinking water health concerns.

The Indian pollution standards stipulate that the BOD of wastewater be less than 30 mg/L for disposal into inland surface waters and less than 100 mg/L for disposal on land. However, as noted before, the concentration of BOD in the wastewater released by sugar mills is sometimes 100x (hundred times) the stipulated standards. Such increased quantities of untreated sugar mill effluents can be extremely toxic. As a result, all the physio-chemical parameters of the sugar mill effluents are very high and way above the permissible limits by the Bureau of Indian Standards.

The effluents have been demonstrated to alter the physico-chemical characteristics of the receiving aquatic bodies and the associated flora and fauna. Extensive damage to fish mortality and paddy crops grown using water with the presence of sugar mill effluents has been widely demonstrated. It has also been noted that farmers who have to use water from sources that have been contaminated with sugar mill effluents face diminished plant growth and crop yield as a result. Moreover, the soil health of the concerned areas was also drastically diminished due to the effluents.

Additionally, the effluents generated by the sugar mills are usually discharged in the nearby water bodies without any prior treatment and can hence, pose a serious health hazard for the rural and the semi-urban populations that are dependent on water bodies such as lakes, streams, or rivers for their water supply. Hence, it can be safely said that the increase in the sugar mill effluents will pose a great threat to plant species, animals, and humans alike. The author submits that this threat can severely impact the country's biodiversity and can have various unintended consequences that will not bode well for anyone.

An increase in the installed capacity of molasses-based distilleries will also increase the amount of sugar mill effluents released into the water bodies and on land, especially given that the government is in favour of making the environmental clearance process for such distilleries easier and faster, instead of making it more comprehensive to ensure that the environmental damage that will accrue from the effluents can be minimised. Together, these factors lead the author to submit that with an increase in the installed capacity of molasses-based distilleries and the consequent increase in the amount of sugar mill effluents discharged into the environment, the biodiversity of the country may be severely threatened.

Threat to India's Food Security?

As noted in the previous sub-section, the increase in the sugar mill effluents can have severe ramifications for the country's biodiversity since it can affect the health of several plant and animal species, along with human health. Even if we keep the deleterious effects of the sugar mill effluents on the environment and biodiversity on one side for the moment, there is also the issue of the impact on food security that arises from the proposal to increase the production of Ethanol through molasses-based distilleries.

Agriculture production is highly dependent on water and is consequently, subject to a host of water risks. Agriculture is also the leading-user and major polluter of water. Therefore, improving agriculture's water management is critical for a sustainable and productive agri-food sector, and ensuring biosecurity. Today, sugarcane and paddy combined use 70% of the country's irrigation water,² depleting water availability for all other crops. Hence, there is a need to change crop pattern and reduce dependence on any one crop for ethanol production. Instead, there should be a move towards environmentally sustainable crops for producing ethanol. However, with the primary focus of the NITI Aayog on molasses-based distilleries for the production of Ethanol, it is clear that the government intends to increase the production of sugarcane further, rather than decreasing its production.

Such increased production of sugarcane will severely impact the availability of water in the country and will consequently lead to diminished production of other crops. Sugarcane is a water-intensive crop. On average, one tonne (1000 kilograms) of sugarcane produces 100 kgs of sugar, and 70 litres of Ethanol. Each kilogram of sugar requires 1600 to 2000 litres of water for cultivation.³ Hence, one litre of Ethanol from sugar requires around 2860 litres of water. With the proposed increase of 400

2 Report of the Task Force on Sugarcane and Sugar Industry dated 3rd June 2020, constituted under the chairmanship of Professor Ramesh Chand, member (Agricultural) NITI Aayog.

3 The water footprint of sugar and sugar-based ethanol, University of Twente, 2009, available at <https://www.utwente.nl/en/et/wem/education/msc-thesis/2009/scholten.pdf>

lakh metric tonnes of sugar to produce Ethanol, the demand for sugarcane will necessarily shoot up. It will consequently strain both groundwater resources and land availability for other crops. Estimates reveal that India will have to produce roughly 132 crore tonnes of sugarcane to meet its 20% ethanol blending target, with a focus on molasses-based distilleries. This would significantly increase the water required to produce sugarcane and will also need an additional 19 million hectares of land (or 1/10th of the country's net-sown area). Hence, diversion of production to sugarcane will likely reduce the availability of water for other crops and cause an overuse of groundwater resources.

In addition to being water-guzzling, sugarcane also requires 9-24 months to harvest and another 3-4 harvests of ratooning.⁴ Hence, any land diverted to sugarcane is rendered useless for growing other crops for at least five to six years.

Moreover, it is very easy to shift the currently irrigated land from one water-guzzling crop to another, i.e., from paddy to sugarcane. The profits from sugarcane cultivation are higher and more secure given the assured returns from the sugar industry. Such a shift will challenge the India's food security by reducing staple-grain production and tacitly discouraging farmers from diversifying into fruits, vegetables, and other high-value crops. Any stress on food supplies and food system diversity may also lead to an increase in food prices. These factors are symbolic of an impending food security crisis.

The two sub-sections above reveal that a molasses-based distilleries intensive model of ethanol production can severely affect the biosafety and food security of the country. The NITI Aayog report has also noted the water intensity of consumption for ethanol production. Still, it ends with a passing remark of the need for exploring other alternatives to supplement sugar in ethanol production. This is highly worrying because making sugar the primary method of increasing ethanol production will have disastrous effects on India's biodiversity and will likely affect its food security too. These effects can more than neutralise any benefits that the country may derive from the increased use of Ethanol per the Ethanol Blending Policy and will likely cause more harm than good. This leads the author to submit that the government should seriously rethink its policy of increased production of Ethanol through molasses-based distilleries, and undertake a course correction when there is still time.

The following section will discuss some of the alternatives that the government can consider for the production of Ethanol to prevent the crises that underlie the increased use of sugar for the production of Ethanol.

4 Ratooning is the process of harvesting the above-ground produce of the crop while leaving the below-ground produce intact to allow for the crop to produce another harvest.

Solutions to Prevent the Biosafety and Food Security Implications

An over-reliance on sugar and molasses-based distilleries to meet the increased demand for Ethanol can be counterproductive and have severe biosafety and food security implications. To combat such over-reliance, there are two broad strategies – a) encourage the use of alternate sources of ethanol production and b) transform the country's vehicle fleet from the conventional combustion-based engines to battery electronic vehicles. The following sub-sections briefly discuss both these alternate strategies and their benefits.

Cellulosic Ethanol as an Alternate to Sugar-based Ethanol

As noted before, the 2018 National Policy on Biofuels called for the use of second-generation(2G) biofuels to achieve the many advantages that accrue from using such biofuels without paying the environmental costs associated with first-generation biofuels. Cellulosic Ethanol is one such second-generation biofuel. It is made from cellulosic biomass such as leaves, stalks, and other agricultural residues, and has several associated environmental and socio-economic benefits, including:

- Less Crop Burning
- Reduce Fuel Import Demand
- Enhanced Energy Security
- Enhance Local Economic Development
- Climate Benefits including GHG emissions savings and better climate performance than 1G ethanol (produced from food-based feedstock).

Given these advantages, the decision to use cellulosic Ethanol over 1G ethanol becomes quite clear. However, the only consideration that the government may have against the use of cellulosic ethanol to meet the growing demand for Ethanol is that a 2G biofuel like cellulosic Ethanol requires more advanced and expensive technology than 1G biofuels. Therefore, it is unlikely that private players will start producing cellulosic ethanol on their own volition without any financial support from the government. This is where the Indian Government should intervene.

To accelerate the production of cellulosic ethanol, the government is already providing Viability Gap Funding (VGF) to improve the financial viability of a cellulosic ethanol project. This is undoubtedly a step in the right direction. However, a report of the International Council on Clean Transportation notes that the current pricing regime of Ethanol, even with VGF, will not be able to generate a financial return that is likely to attract private investment. Therefore, the development of the cellulosic ethanol industry in India will require additional policy support which extends

beyond the VGF program. Policy measures such as having a different pricing category for cellulosic Ethanol as compared to 1G ethanol, a per-litre subsidy for cellulosic Ethanol, increasing the corpus of the VGF program and the consequent per-project grant, providing interest subventions to cellulosic ethanol projects (similar to what has been done for molasses-based distilleries), can help provide the necessary support to establish the cellulosic ethanol industry.

Furthermore, the amount of cellulosic ethanol proposed to be used to meet the gasoline demand must be increased from the current 1% to a more substantial percentage to ensure that cellulosic Ethanol can play a substantive role in reaching the blending target, enhancing the national energy independence, while preserving the environment.

Converting National Vehicle Fleet to Electronic Vehicles

The challenge of producing ethanol required to meet India's growing demand can be tackled by converting an increasing share of India's vehicle fleet to battery electric vehicles (BEVs). The problem can be solved by reducing the overall demand for fuels, and consequently biofuels. India is well-positioned in this regard. Research by the International Council on Clean Transportation demonstrates that many electric two-wheelers in India have a lower total cost of ownership (TCO) than their internal combustion engine (ICE) counterparts, i.e., electric two-wheelers are cheaper than non-electric two-wheelers. With the proper policy support, larger electric vehicles and those with greater range can also reach TCO parity within ten years. In fact, the Indian government has recognized this growth potential and announced its EV target of 30% private vehicle sales by 2030.

Setting ambitious fuel efficiency standards and zero-emission vehicle production requirements are critical to India's oil security and decarbonization objectives. The particular economics of how to produce electronic vehicles effectively and use these to substitute the existing internal-combustion engine vehicles is beyond the scope of this paper and has been well documented elsewhere.

Either of these strategies can help India achieve the stated goals of the Ethanol Blending Policy, i.e., strengthen its energy security, enable local enterprise, enable farmers' participation in the energy economy, and reduce vehicular emissions, without India having to pay the heavy environmental costs associated with the sugar-based ethanol production that the government has seemingly adopted. The author submits that the government will be well-placed to reconsider its strategy of ethanol production and consider the suggested alternatives more thoroughly.

Conclusion

Blending Ethanol with petrol to boost India's energy security, develop local enterprise, and reduce vehicular emissions is a robust strategy. However, the method for producing Ethanol to meet the increased demand, i.e., sugar-based ethanol production, is highly problematic and will lead to severe biosafety and food security implications. The drawbacks of sugar-based ethanol production will likely eclipse the benefits that accrue from the widespread use of Ethanol in India. Hence, it is advisable that the Indian Government course-correct when it still has the time and select long-term solutions of developing a robust cellulosic ethanol industry and converting the vehicle fleet into electric vehicles. These solutions will enable India to achieve the National Policy on Biofuels' stated objectives in a stable and environmentally sound manner. In conclusion, the author would remind the government of the adage, 'better late than sorry.'

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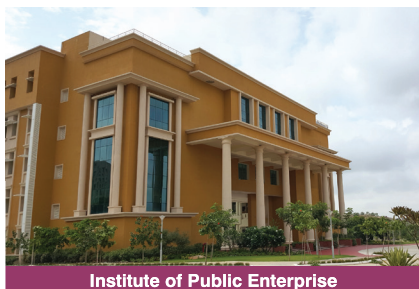
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