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CONTENTS

Museums in India:
Potentials and Possibilities

Dr. Chandra Bhushan Kumar

Abstract

UNESCO lists 95000 museums world over. USA notes the presence of 33080 museums, China has 1030, Russia has 5400 and Brazil has 3835. 800 of these are in India, the second most populated and the seventh largest country in the world. Museums are acknowledged as the locations where the tangible and intangible heritage of a society is preserved. Museums have social, cultural, scientific and economic values. In a diverse country like India, the potential of museums is immense. However, unshackling the stereotypical image of the traditional museums which focus on history and cultural past, there exists possibilities to concentrate on contemporary themes from different periods. In this paper, using an example of setting up an election museum, it has been advocated that with focused and decentralised interventions, theme-based museums can be established, which may serve as locations of public spaces for engagement, tourism, sensitisation and education. In the process, it will help in archiving processes and artefacts to appreciate the evolution of diverse sets of heritage in a vast country like India.

Introduction

On 16 October 2021, the Election Museum-cum-Education Centre curated in the old St. Stephens College building, which houses the office of Chief Electoral Officer, Delhi, completed five years of its existence. This is the first formal housing of evolution of electoral processes in modern India, the largest electoral democracy in the world, to showcase this rich legacy of last seven decades of people's engagement in the political process. It serves multiple purposes: first, curating the legacy of successful conduct of elections through images, texts, artefacts, games etc.; second, allowing younger generations to interpret the meanings of electoral democracy and its various elements, and appreciate the vastness and diversity of the efforts; third, celebrating elections as one the most powerful modes to voice the choice(s) of the common people; and fourth, instilling a sense of pride in the visitors with reaffirming the trust in the electoral system.

A theme-based Museum is not uncommon. Museums, focused on scientific

progress, technological changes, article-specific like doll, telephone, car, toilet etc. take visitors through the journey from their origin to present. Democracy as a theme for museum has also been used to design museums of Parliament in Australia and in India. Museums dedicated to personalities like Gandhi, Patel, Vivekanand, Ambedkar also exist. In Selma, Alabama, USA, there is a museum on National Voting Rights that is focused on struggle for voting rights for black and women in that country.

Museums, in modern world, are not only considered cultural repositories of past connected to power and economy but are also acknowledged as public locations to demonstrate the possibilities of social cohesions leading to public participation[1]. In the last 45 years, globally, there has been a jump of 350% in the number of museums (from 22,000 in 1975 to 95,000 in 2021)[2]. At present, India lists 800 museums. USA, a country with one fourth of India's population, boasts 33,080 museums.

Museums boost cultural diversity, influence civic engagement, attract visitors, add to knowledge economy, contribute to the local economy, and enhance the overall appeal of the neighbourhood or region[3]. It promotes preservation of heritage and allows visitors to appreciate its multiple layers and meanings. It serves as a bridge between past and present. It encourages curiosities and propels imaginations for future innovations.

India has tremendous potential for museums. In 2019, the Ministry of Culture laid down a detailed set of deliverables for this purpose. It has a continuing scheme for financial grant for the museums run by States/Union Territories, autonomous bodies, voluntary organisations etc. It can further be strengthened and expanded keeping three key elements-community, culture, civic engagement- in view. Amalgamation of these will unlock the potential, which can be tapped for social cohesion as well as economic regeneration.

Using the example of creation of Election Museum, this paper would argue that there is an urgent need to demystify the term 'museum' in common parlance and to showcase the heritage of contemporary era for better connect in the process of nation building. It suggests that the capacity of local policy entrepreneurs can be enhanced to curate such museums so that authenticity is assured and the visual narratives remain engaging. Its integration in local ecosystem will provide the purpose and help in its survival and continuity.

This paper is structured in the following manner: first, it positions the setting of museums in human history; second, it examines the contemporary meaning and scope of museums; third, it describes the process of setting up the Election Museum in Delhi, fourth, it advocates the need for proliferation of museums capturing the essence of vastness and diversity of the country; and, finally, it recommends for appreciating the potential of museums (and similar public

spaces like libraries) in reassessing the past, present and future with open minds.

Museums and its evolutions

The term museum has the roots in the Greek word *mouseion*, which means "seat of the Muses" and designated a philosophical institution or a place of contemplation. In ancient times, stupas, which exhibited the remains of Buddha along with his life and teachings, dotted the vast landscape of India. These were some of the earliest examples of museums. During the period of renaissance, the term museum was revived to describe the collection of Lorenzo de' Medici in Florence, which conveyed the comprehensiveness rather than denoting a building. Using 'museums' as locations of items of curiosities first started in Europe. Imperialism coupled with industrial revolution provided impetus to the spread of museums across the European nations[4]. These European nations started museum projects in colonies as well to produce a linear narrative of past with paternalistic approach[5].

The Indian Museum[6] at Calcutta was established in 1814 with the efforts of Asiatic Society of India. The Archaeological Survey of India, Geological Survey of India, and Zoological Survey of India helped in establishing more museums, particularly site museums in the country. Colonial control also witnessed the transfer of Indian artefacts at will to the museums of the world. These precious antiquities of the past found were displayed in numerous museums like British Museum.

Post-independence, the National Museum came into existence in 1949 in New Delhi. In this period, museums acquired a new meaning as the custodian of cultural heritage to instil a sense of pride. Thapar (2014) writes;

> Fernand Braudel spoke of the three dimensions of time relevant to every historical event. These are, the moment when the event happens, then the longer background of the event, and finally the long duration - the many centuries that mould the landscape of the event. To this has been added the fourth, namely, the point in time when the observer perceives the object in a museum.

Gradually, personality-based and theme-based museums also emerged at different locations in the country. All the capital cities of State/Union Territory put up new or expanded the existing museums to showcase the cultural heritage or advancement of that State/Union Territory. Mahatma Gandhi emerged as one of the favourite personalities to feature in museums dedicated to his works at various locations associated with his life.

Museums and its contemporary meaning and scope

Internationally upkeep, preservation and promotion of museums has been advocated by UNESCO. The recommendation concerning the Protection and

Promotion of Museums and Collections, their Diversity and their Role in Society is the first specifically related to the world of museums, since the recommendation concerning the most effective means of making museums accessible to all, adopted by the General Conference of UNESCO at its 11th session, on 14 December 1960. In 2007, it defined:

> Museums are non-profit, permanent institutions in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment[7].

Globally, the number of museums has witnessed a steep rise from 22000 in 1975 to 95000 in 2021. More than one-third, 33,098 of these are located in the United States of America followed by Germany (6257), Japan (5738), Russian Federation (5415), France (4811), and Brazil (3835)[8]. India has 800 museums. Acknowledging the power of museums in cultural promotion and revenue generation, the countries are promoting the establishment of more museums and recreating virtual museums for better outreach.

The American Alliance of Museums found that American museums generate annually USD 50 billion in GDP and USD 12 billion in taxes to local, State, and federal governments and account for 726200 jobs. The Lénovo Institute undertook an assessment of the economic impact of Finnish Museums in 2014, and found that the regional spending by museum visitors is about three to six times the funding that museums receive[9]. Integrated passes for visitors combining access to several sites and services are a well-known model of audience development. Examples include the Salzburg Card for tourists and a trans-regional museum pass offering entry to 320 museums in a cross-border region between France, Germany and Switzerland.

Besides the dominance of big city museums, there has been attempt to promote museums at community level in smaller cities. OECD prescribes a guide titled, "Culture and local development: maximising the impact A guide for local governments, communities and museums". This guide provides a roadmap for local governments, communities and museums on how to define together a local development agenda. It considers five dimensions: 1. Leverage the power of museums for local economic development, 2. Build on the role of museums for urban regeneration and community development, 3. Catalyse culturally aware and creative societies, 4. Promote museums as spaces for inclusion, health and well-being, 5. Mainstream the role of museums in local development[10].

UNESCO also came out with set of recommendations keeping the current challenges and contemporary socio-economic realities in context:

The Recommendations[11] aims to propose a reference framework for museums and collections:

1.   It defines the museum, the collection and the heritage.

2.   It recalls the main functions of a museum, namely preservation, research, communication and education.

3.   It mentions the main challenges for museums in society:

- Globalisation, allowing greater mobility of collections, professionals, visitors and ideas.

- The relations of museums with the economy and quality of life, with museums participating in the urban or tourist development of cities and regions. The recommendation recalls that economic challenges and income generation must not be at the expense of the main functions of museums.

- The social role of museums which can play a central role in social cohesion, the building of citizenship and reflection on collective identities.

- Information and Communication Technologies (ICTs), which also offer major development opportunities for both museums and their users.

4.   In this context, it presents the policies to be implemented by the Member States:

- General policies and in particular international instruments must be implemented by museums. Member States must adopt policies to ensure the promotion and protection of museums.

- Functional policies related to museum functions, inventories, protection of non-museum collections, ethics, training, funding, ICT development, public development and the social role of museums.

In this changing role of museums, this paper presents a case study of establishment of a museum dedicated to the theme of elections in the capital city of Delhi in the next section.

An Election Museum in Delhi

Elections in India are gigantic exercise. Size, scale and complexity of this operation is unparalleled in the human history. In last seven decades, the election process has generated mammoth data, images and stories. Experiencing a scale and spread of this democratic participation is an enriching exercise itself, as it reveals the layers of political history of modern India. Continuity and changes in the conduct of elections exposes evolving and adapting journey of Indian elections. It is, in true sense, a legacy of consistent human efforts in preserving democracy, the most expected mode of governance.

Elections consist both tangible and intangible elements. Artefacts like ballot box (now, Electronic Voting Machine), ballot papers, indelible ink, etc. have been the visible symbols (tangible) whereas, narratives like deletion of names as women did not provide their names in large number of cases or contrasting campaign slogans, reflect intangible elements of this legacy.

In this background, the conceptualisation of Election Museum was initiated in the office of Chief Electoral Officer[12], Delhi in August 2015. Following questions arose for this purpose:

1. What would be displayed in an Election Museum?
2. Who would curate it?
3. Where should it be located?
4. How the fund would be arranged?
5. How this could be managed on day-to-day basis?
6. Why should we do it? What purpose it would serve?

Stereotype meaning and image of museum is common and seems a known barrier in its expansion. Curating a museum is considered an advance professional skill difficult to mobilise. It is difficult to imagine running a museum without the active engagement of professionals who are skillful in managing the tangible artefacts, mostly delicate, fragile and in need for careful preservation. For an organization tasks with conduct of periodic elections seemed an alien aspiration.

The Chief Electoral Officer took upon himself to learn by visiting museums across the country with the support of Election Commission. Visits to Oil Museum of ONGC in Dehradun, Salarjung Museum at Hyderabad, Sabarmati Ashram at Ahmedabad, Gandhi Museum in New Delhi, Science Museum in New Delhi, and National Museum in New Delhi allowed to learn various facets of museum. The Chief Curator of National Museum was invited to discuss the prospect of a museum focused on elections. Continuous interactions helped in demystification of museum amongst the team members of the office of Chief Electoral Officer.

Much before this work started, in January 2015, the office received a communication from Gandhi Heritage Sites Mission[13], Government of India informing that the old St Stephens College building is one of 39 core sites of Gandhi Heritage and it would like to preserve it. In the hectic and frenzied time of upcoming elections on 7 February 2015, this was almost forgotten. On 13 April 2015, members from Gandhi Museum and related organisations like Gandhi Peace Foundation, led by the indomitable Anupam Mishra (1948-2016), visited the office and over the priceless image snapped a century ago (Figure 1).

Figure 1: Prof. S.K. Rudra, Mahatma Gandhi, Kasturba Gandhi and C.F. Andrews at St. Stephen's College, 13-04-1915

Figure 1: Display in Election Education Centre-cum-Museum, Delhi (photo: ceodelhi.gov.in)

By the end of October 2015, the team was convinced to take a leap of faith. The historic location of the office appeared obvious choice for new museum. Existing funds to renovate the space was available. Delhi Tourism and Transportation Development Corporation(DTTDC), a government agency, was then asked to carry forward the idea. After following the bid process, Creative Architect, a family firm led by Rajiv Gupta came on board. Numerous interactions with DTTDC and the architect firmed up the architectural renovation of the first floor of the main building to house the proposed museum.

This historic Indo-Saracenic building was designed by Col. (later Sir) Samuel Swinton Jacob (1841-1917), Chief Engineer of Jaipur State during early 1890s to house a college (image2).

Its first floor, now used as store to keep discarded materials, with 6000 square feet looked just appropriate for this ambitious task. Presence of lofts, arches and open spaces helped in creating a sense of awe. It was estimated to complete the renovation task by June 2016.

However, electrification and panel work took considerable time and it could complete only by the end of September 2016.

The architect's diary[14] notes:

The existing architecture was all about arches, stone flooring, concrete walls, winding staircases, arch vaults going in both directions. The design was made to use these vaults, channel the floors and assign sections to various artefacts. Each vault was a crisscross of arches and space was divided in such a manner that sectional zoning and free flow movement can go hand in hand. The design was more concentrated by using proper lighting, repairing the arches,

exposing the old woods with highlights, manipulating the walls through panelling, creating niches to display the artifacts. It was an amalgamation of the function and the program with the existing heritage of the structure. Careful attention was given to the movement flow in the museum for the visitors, especially the school children, who are the primary target of the election museum, to impart awareness about each and every phase of the electoral journey and its significance in Indian democracy.
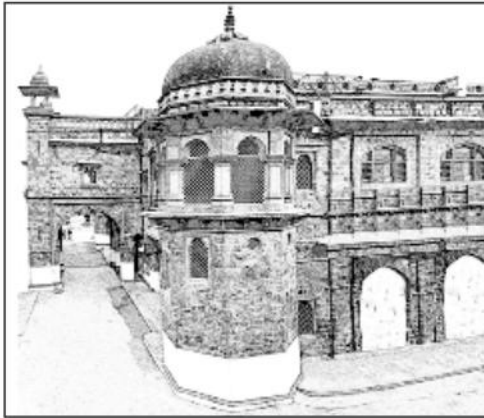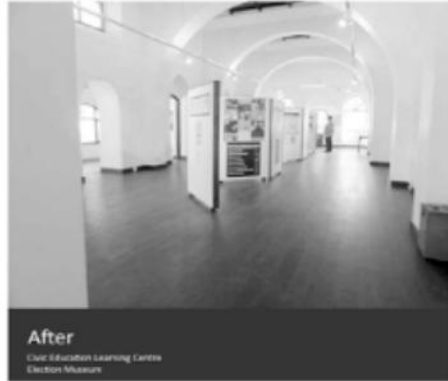

Figure 2: Display in Election Education Centre-cum-Museum, Delhi (photo: ceodelhi.gov.in)

Before
Civic Education Learning Centre
Election Museum

After
Civic Education Learning Centre
Election Museum

Before
Civic Education Learning Centre
Election Museum

After
Civic Education Learning Centre
Election Museum
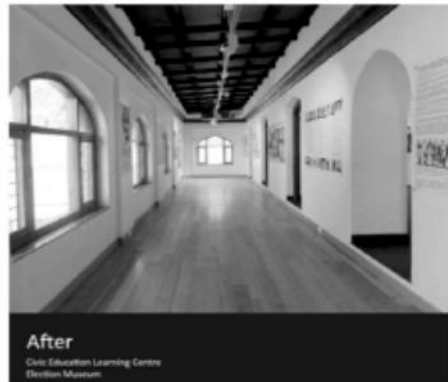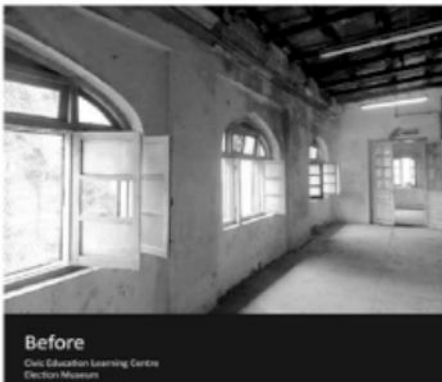
Figures 3-8: Election Education Centre-cum-Museum, Delhi (photo: ceodelhi.gov.in)

Sourcing and organising the display material for this museum continued simultaneously. Chronological evolution of Indian elections is familiar to the readers of modern India. The website of Election Commission (eci.gov.in) is a paradise for archival material. From the very first elections, it has digitally archived more than one million pages of electoral history created by successive commissions. Its narrative reports are like a goldmine for researchers and policy practitioners. Another great place to unearth India's electoral legacy is Photo Division, a media unit of Ministry of Information & Broadcasting, Government of India. Its digitisation scheme has helped in accessing the images concerning elections since the beginning. These images evoke a visual connect to the times of earlier generations' engagement with elections. Film Division, Mumbai and All India Radio, Delhi also have rich repositories of documentaries and speeches concerning elections. In the Delhi Archive, instructions, maps related to Indian elections can be found. District offices are storehouses of information and items pertaining to elections. The result is visible in figures 3-8.

The first floor of the building was organised in five main portions for various displays: first, is a library to keep books and a small reading room; second, displays of voting methods (figures 9-10) and a video hall to view a Film

Journey from Ballot Box to EVM with WPAT

Figures 9-10: Display in Election Education Centre-cum-Museum, Delhi (photo: ceodelhi.gov.in)

Division movie on the first General elections (1951-52) and another movie on the last general elections; third, provides a visual collage of electoral journey in India, punctuated with a display of ballot boxes used in the first elections and the changing nature of symbols used by political parties. It also has maps of results of first two elections depicting the changes in the political landscape of the country (image 11-12). Fourth, focusses on electoral processes starting with delimitation and roll preparation. It also has the largest ballot paper consisting 1033 candidates in an election in India. There are a few
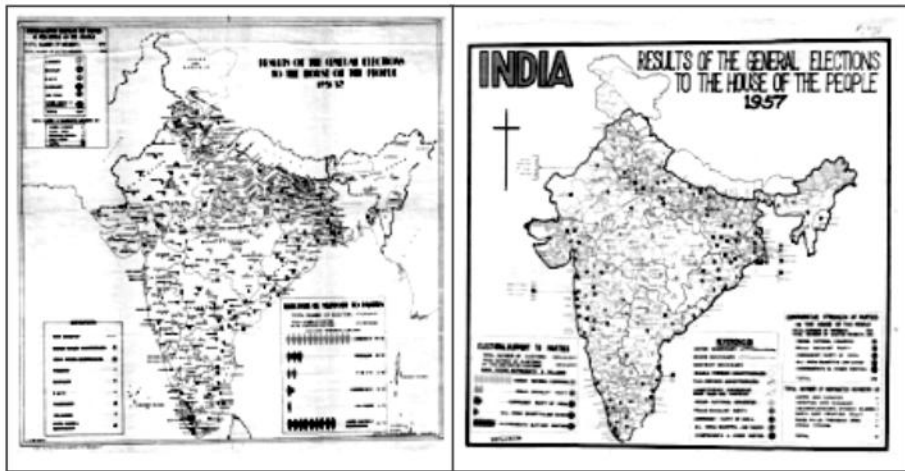
Figures 11-12: display in Election Education Centre-cum-Museum, Delhi (photo: ceodelhi.gov.in)

instructions on elections of pre-Independence era. Fifth, a gallery of Gandhi disclosing his ideas on elections, curated by National Gandhi Museum. One learns that on 25 June 1894, his first petition to the Natal Assembly was against the disenfranchisement of Indians, where he famously wrote:

> "The Indian nation has known, and has exercised, the power of election from times far prior to the time when the Anglo-Saxon races first became acquainted with the principles of representation."[15]

On 16 October 2016, full Commission led by Dr Naseem Zaidi, Chief Election Commissioner in the presence of two Election Commissioners Shri A. K. Joti and Shri O.P. Rawat inaugurated the Election Museum.

Subsequently, the inhouse staff was trained to brief the visitors, particularly school children. In its first year, it received a footfall of more than ten thousand. Signages for visitors have been put up at the nearest Metro station, Kashmere Gate. Delhi School Education department has added this destination in its local visits for the school children. ITIHAS, a voluntary organisation has used it as summer heritage project for school children drawing from various schools in Delhi. Delhi tourism mentions it as one of the museums to be explored by the tourists. From the very beginning, it was planned to use the space as

interactive civic education centre focussed on electoral values. Competitions like essay writing (image 13-14), quizzes, and projects have been designed and implemented.
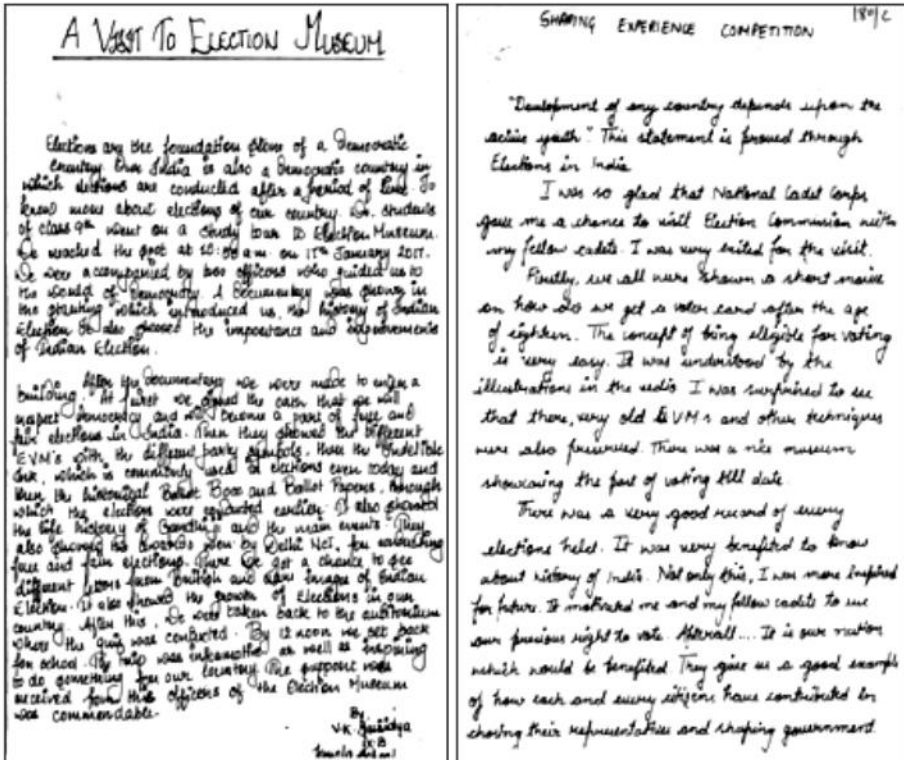
Figure 13-14: Taken from the first report on election museum (source:ceodelhi.gov.in)

The museum also received its virtual version from the Sabarmati Ashram Trust, which is available on the website[16]. In its first year itself, the museum received a National Award in the category of Special Innovation from the President of India on the occasion of National Voters Day on 25 January 2017.

If museums are the locations to store the heritage and heritage includes all those which are accomplished through a process that survives and earns the respect of being termed as tradition, then evolution and embedding of electoral scheme in the project of democratic nation must find a suitable space in public imagination to cherish and preserve the tradition so that, the current and the future generations are exposed to the tumultuous electoral journey and get inspired to imbibe and to belief in the power of vote that makes a mode of governance more viable.

Diversification and Demystification

Globally, the power of museum in preservation and propagation of idea(s) is acknowledged. Museums are not restricted to the matter and material

concerning distant past only. Contemporary times provides innumerable opportunities to explore, identify theme-based exposition in a structured manner.

Grand museums will continue to be constructed in project mode with larger viewership in mind. However, there is an emergent need to travel beyond the familiar narratives. India is a vast and diverse location to house innumerable stories in each district. It may be folk based, community preserved artefacts, nature based, or something else. One needs to take a plunge in the everyday life of the surrounding. Young members of Indian Civil Service need to be encouraged and pushed to venture in this project, which can begin from her/his training days. It can become part of governance project focused on the development of knowledge economy.

Localised efforts have the potential to build networks of knowledge located in communities, their folklores and traditions. Consistent focus on grand narratives often obscures the possibilities of subaltern narratives. It needs to be recognised and acknowledged with due care. Care is needed to avoid negativity, hatred, and jingoism. Selection of theme(s) would be the most crucial and foundational element in this effort. It must get local connect, which is important for ownership, survival, continuity, and linkages for local development. Handholding of such efforts helps in nurturing it in its nascent stage. From the beginning, it must be planned keeping sustenance in view. Constant supervision and monitoring are essential.

School children must be the most important stakeholder in such initiatives. Museums and libraries are two important public spaces for the flourishing of the infantile brain. While curating a museum, it must be from the perspective of young minds. They travel, generally, in a group, which has a potential to generate active engagement. They are curious, which helps in planning and curating a museum from a learner's point of view. Their large numbers keep the space public in real sense. It encourages their teachers and their parents, the earlier generation, to get connected to such efforts. This will lead to social cohesion and revival of cultural heritage, tangible or intangible or both.

India notes the presence of 800 museums at present. Most of these are either located in large cities or at the archaeological sites as site museums. Not every district (approximately 750 in number), basic administrative unit[17] of governance, boasts a museum. Census 2011 notes 7935 towns, except 3894 census towns all other are managed by urban local bodies. These numbers suggest yawning gaps in establishment of museums at the local level.

Museum, in the scheme of governance, is a State[18] subject. Ministry of Culture, Government of India has already provided deliverables for development of a

museum[19]. This template (see Annexure 1) is useful to conceptualise, design, execute, and popularise a museum. The Ministry also provides a scheme of grant to support the museums financially. It has also developed a digital repository titled JATAN, in collaboration with C-DAC Pune, to list all artefacts etc. displayed in museums[20].

These details suggest potential and possibilities of museums in India for the benefits of all the stakeholders.

Conclusion: Way Forward

Museums are locations of public engagement which facilitate learning, tourism, conservation, and social cohesion. Traditionally, museums are described from a grand perspective suggesting large scale investment and resource needs. In this paper, the description of experience of setting up of the election museum demonstrates that one need not look up to the State to imagine and execute a museum on an off-beat or mundane topic.

Secondly, in a heterogenous society like India which boasts thousands of communities, and hundreds of living languages, museums offer opportunities to explore and identify suitable themes reflecting the tangible and intangible heritage- tangible and intangible that need to be preserved, promoted and celebrated.

Thirdly, a focused approach will help in making museums as knowledge hubs and in building networks, which have the potential to transition the cultural values of the past to our future generations. Museums are such locations which will encourage the curiosities to reinterpret the meaning of things/processes in own ways. This will help in inducing more public engagement.

Fourthly, tapping the potential of museums will lead to economic regeneration and better social cohesion. In these complex and complicated times, these are needed to bring solace in communities.

Fifthly, creating templates of museums based on broad deliverables (Annexure 1) will assist the local machinery in conceptualising, designing, and executing theme-based museums in localised environment, at the level of district.

Sixthly, drawing the attention of young civil servants to appreciate the utilities and to explore the possibilities of public spaces like museums, libraries etc. in their territorial jurisdictions during their training at Lal Bahadur Shastri National Academy of Administration, Mussoorie in the form of a module.

(The views of the author are personal)

References

[1] https://en.unesco.org/themes/museums

[2] Ibid

[3] https://www.oecd-ilibrary.org/docserver/9a855be5-en.pdf? expires= 1630477074&id=id&accname=guest&checksum=04138B810947DCE264B823726 A2526C2

[4] See https://www.britannica.com/topic/museum-cultural-institution

[5] https://www.india-seminar.com/2014/659/659_romila_thapar.htm

[6] The museum which was known in the beginning as the "Asiatic Society Museum" subsequently came to be known as the "Imperial Museum" later familiarized as the "Indian Museum". The museum is more familiar by the name Jadughar or Ajabghar among the visitors. (https://indianmuseumkolkata.org/ informations/MQ%3D%3D/history-of-indian-museum)

[7] International Council of Museums (ICOM), Article 3, Statutes, 2007

[8] https://studyinginswitzerland.com/most-visited-museums-in-the-world/

[9] Piekkola, H. et al. (2014), Economic impact of museums, University of Vaasa, Levón Institute.

[10] https://www.oecd-ilibrary.org/industry-and-services/culture-and-local-development-maximising-the-impact_9a855be5-en

[11] https://unesdoc.unesco.org/in/documentViewer.xhtml?v= 2.1.196&id=p::usmarcdef_0000371549&file=/in/rest/annotationSVC/Downloa dWatermarkedAttachment/attach_import_0758b40b-f5c8-4d37-ad36-2242307dc6fb%3F_%3D371549eng.pdf&locale=en&multi=true&ark=/ark:/4822 3/pf0000371549/PDF/371549eng.pdf#%5B%7B%22num%22%3A33%2C%22ge n%22%3A0%7D%2C%7B%22name%22%3A%22XYZ%22%7D%2C58%2C809%2 C0%5D

[12] Chief Electoral Officer is an officer notified under the Representation of People Act, 1950 by the Election Commission of India in each State/Union Territory of the country. She/he is responsible for supervision and control of elections under the overall superintendence, control and order of Election Commission.

[13] https://www.indiaculture.nic.in/gandhian-heritage

[14] https://www.creatorsarchitects.com/works-election-museum-and-education-center-Delhi.php

[15] para 7 of the petition (CWMG Vol. 1, p. 128)

[16] https://ceodelhi.gov.in/electionmuseum/index.html

[17] A member of Indian Administrative Service with few years of experience acts as executive head of the district. It is similar to a county in some of the western countries.

[18] As per seventh schedule of the Constitution, the responsibility for law making and management concerning museum rests with the local State government.

[19] REFERRED IN PART (a) TO (b) OF LOK SABHA UNSTARRED QUESTION NO. 3301 FOR 9.12.2019 REGARDING "DEVELOPMENT OF MUSEEUMS".

[20] http://164.100.47.194/Loksabha/Questions/QResult15.aspx?qref=9767&lsno=17

Annexure 1

IMPROVEMENT OF MUSEUMS (source: http://museumsofindia.gov.in)

Objectives / Deliverables

1. Management of Museum Space:

1.1   At least 75% of the total carpet area should be used as Public Area and rest carpet area should be used as Non-Public Area. International Standards for Public and Non-Public Area is as below:

PUBLIC AREA NON-PUBLIC AREA

Display Area (includes permanent and temporary display/Exhibition/ Galleries) Public Facilities Area (include lobby, shop, library, cafe, toilets, cloakrooms, theatre/auditorium etc.) Storage Area (includes collection storage, shipping & receiving area etc.) Offices Area (Offices, conservation space, exhibition installation workrooms, security stations, staff washrooms etc.)

(A) (B) (C) (D)

Space distribution as per International Standards 40 20 20 20

1.2   Existing space should be rearranged or constructed new space (if needed) to accommodate more display space and less administrative space. Public space (i.e. display & facilities) should be in front of the building while non-public space (i.e. storage & offices) should be in the back-end of the Museum's building.

1.3   There should be logical allocation of space ratio among aforesaid four categories (i.e. Display, Storage, Public facilities and Offices) on the basis of international standards and total available collection different time period wise & category wise in the Museum.

1.4   There should be fixed allocation of space for permanent and temporary exhibitions/galleries. Space allocated for temporary exhibitions should not be more than 5% of the total display area.

1.5   Percentage of objects to be displayed and kept in storage to be broadly fixed and accordingly space requirement to display objects to be worked out by the Museum.

1.6   Museum should develop adequate visible storage facility with atmospheric control such as heat, temperature, humidity, dust, light & pest etc. along with fire fighting in the Storage Area and Display area as well.

2. Display of Artefacts:

2.1   Atleast 10% of total objects should be available in display while rest of total object should be kept in proper storage.

2.2   Museums must rotate their objects in display frequently. Rotation of 10% display objects in each quarter wherever possible depending on size, type etc. of the objects. The objects like paintings, small sculptures etc. may be rotated fast whereas rotation of big sculpture is not possible.

2.3 Museum should identify its masterpieces and all these should be displayed prominently by using magnifier, focus light, 360 degree orientation so that it would be centre of attraction in the Galleries. Description of masterpieces should be provided in the leaflet of the Museum.

2.4 Museum should categorise its entire collection broadly on the basis of types of collection (like Archaeology, Ethnography, Textiles, Paintings etc.) and different periods of history. All types of collections should be displayed in the permanent Exhibitions/Galleries for bringing more variety in the display.

2.5 Museum should organize temporary exhibitions in collaboration with International and other National Museums regularly. For such exhibitions, objects may be arranged from store collections and/or loaning of objects from other Museums.

2.6 Introducing new technologies in display to :

(a) Make the collections accessible, explorable and enjoyable not just those who visit the museums, but to everyone so it becomes the private museums of the whole world---Museum of the Citizen (Mobil apps and e Museum etc.)

(b) Allow new ways such as interactions, experiential and explorations of visiting the galleries/exhibits for transmitting information about the collections and to engage visitors with the objects.

2.7 To facilitate visitors in getting take away message and with a spark to learn more about Galleries/Exhibits, Museum should use more new technologies and modern display techniques in presenting the interpretation of museum objects. Structured information about the displays/exhibits should be presented.

2.8 Museum shall identify surplus items which could be shared with other museums for display purposes.

2.9 Ensure good quality spot lighting with auto-switch, power saving and heat control etc. on displayed objects.

2.10 The light colour should generally be used for painting walls of the display rooms and flooring so that look & focus prominently display.

2.11 Display standards and norms for gallery text, interpretation, lighting, showcases, signage, orientations, labelling, marking, display room wall colour etc. should be followed.

2.12 Display of artefacts in the open area of the museums to the maximum extent. Railing of outer boundary wall should be reconstructed in a way that it would not hamper the visibility of artefacts displayed in the open area of the museum.

2.13 A world-class upkeep & cleaning of the space including display objects should be carried out by the Museum. Mechanized cleaning including chemical should be used to cover every nook and cranny including ceiling (except heritage building where it is not allowed).

2.14 QR code/RFID tag/labels on objects should be display in a way that it would not hamper the display of objects.

3. Collection Management Software (CMS)

3.1 All Museums should have IT based collection management system (CMS) to record and retrieve documented information easily about its collection. CMS should have features such as acquisitions, accessioning, inventory control, exhibition management, conservation management, cataloguing, management of movement & locations, loaning & borrowing management, dispatch/shipping/transport of objects, de-accessioning/disposal etc.

3.2 Data entries of the objects in the CMS should be in the standard format. The query based search features should also be available in CMS.

3.3 Architecture of the CMS should be flexible and dynamic in nature and have secure access.

3.4 The record of digital collections should safely be stored and backup should be taken and stored periodically.

3.5 The digital collection should be presented to the public in a ways that it meet accessibility standards and are compatible to adaptive technology.

3.6 Museums should have a professional quality digital photograph [at least four images of at least 300 dpi and short video with photos of masterpieces] of its entire collections (3D images and 360 degree view) which should be uploaded/available along with its metadata, descriptions in CMS and also available on online website for public viewing.

3.7 The details of all artefacts of the Museums should be available in the accession register in the standard format. The latest IT tools / platforms may be used to keep digital and electronic form of accession register. The accession register should be archival quality and should be kept at secure and another location.

3.8 The artefacts should be physically verified along with their conservation, preservation and restoration status periodically in accordance of global standard. After verification, the objects which need treatment may be carried out as per global best practices/standard. Before and after photograph of objects should be saved.

3.9 CMS should also have a feature for managing QR code/ RFID tag for security and safety of the objects. No separate IT system for RFID tagging should be used.

4. Value addition to the Museums

4.1 Museums should update their website as dynamic website in the nature of virtual museum and should show user friendly 360 view of its galleries /exhibitions (viz. e Museum). To introduce Mobile apps based application where detailed information of all exhibits /Galleries may be made available in the Mobile apps also apart from Museum's website. The information in the app may be structured in different tiers such as Basic Information, Intermediate Information and Advanced Information.

4.2 Museum shall make available their entire publications, research papers, etc. and would make them available online to the public through their website and shall use optimization techniques to make their publications/research papers etc. on top while searching on Google. (access from anywhere to anyone). Introduce Museum related activities cum technical research blog.

4.3 Install interactive hands-on mask making kiosks for children and LCD's with running films.

4.4 Introduce latest technology such as 3-D holographic projections, simulated images, virtual reality and augmented reality wherever feasible.

4.5 To Upgrade and modernize existing conservation labs and set up new laboratories for authentication & provenance and preventative conservations.

4.6 Museums should do preferably light illuminations on the Museum's building for night viewing.

4.7 Museums should organize light & sound shows, projection mapping etc. depicting the history and cultural traditions of the city of their location.

4.8 To setup interactive/experiential/exploration children centre which would enable to disseminate knowledge about rich culture heritage by using latest technologies.

4.9 Museum should arrange regular social gatherings like conference, workshop, special conducted tours, films screening, research publication for disseminating knowledge/education to groups and should also earmarked separate space for such activities.

4.10 Museum should have a calendar of events for every months and it should be displayed / advertised prominently including on its website.

4.11 Have separate conducted tours for all categories of populace. They may not all be interested in seeing the entire museum. Create something for everyone.

5. Visitor facilities

5.1 Arrangement of comfortable benches, resting places, nooks/seating corners, drinking water & clean toilet facilities for visitors.

5.2 Have shops in museum premises for (i) selling cultural staff (ii) cafeterias and vending machines for catering different types of foods need. These facilities may be worked out on outsourced model.

5.3 Museums should introduce guided tours (both paid and free) and Audio tour as well. Museums may engage enthusiastic volunteers as museum's assistant for guided tour. To begin with, twice a day guided tour (in English & Hindi) may be introduced and one regional language guided tour may also be added later on.

5.4 Have well dressed and polite museum assistants/guides and cafeteria staff.

5.5 Museums should have a photography counter, free Wi-Fi facilities and interaction area for public.

5.6 All public areas should be accessible by all including differently abled citizens (ramp, lift etc.).

5.7 Introduce online/ e-ticketing facilities for visitors.

6. Standard security and fire fighting

6.1 Museum should install fire-fighting devices/techniques and to undertake regular trials.

6.2 Museum should maintain friendly, terror/stress free atmosphere in the galleries.

6.3 Museum should sensitize security personnel and should have lots of CCTV cameras and alarms in the museum premises. RFID tagging/QR code etc. should also be introduced to enhance security of artefacts/objects.

7. Outreach Activities

7.1 Museum should give focus on its memberships and should design various categories of memberships for catering different types of people.

7.2 Museum should organize regular dance/music performances in grounds/ auditorium.

7.3 Make museum visiting an entire day's experience with competitions and other events. Therefore, all museums should design an experience for visitors which would include visit to the exhibitions, participation in Hands-on workshops/Design studios, live demonstrations, audio-visual shows, cafeteria, gift stores, resting areas, children spaces, interpretation centres, audio-guides/ interactive devices for accessing information and other visitor amenities.

7.4 Have separate entertainment spaces in Museums with indoor games facilities Table-tennis, Pool Bowling alleys etc.

7.5 The social entertainment spaces in museums may be open late till 8:00 PM especially on weekends.

7.6 Museums can prepare small exhibitions on various themes and take them to schools for the duration of 7-10 days per school.

7.7 Museums may work out a plan to bring underprivileged children to the Museum so that these children may also get an opportunity to gain the knowledge relating to the Indian History, Culture and Science. Mobile exhibitions may also be introduced to cover underprivileged sections of the society (rural, slum and far flung area).

8. Marketing

8.1 Bill-board advertisements of events in Airports and other areas even in nearby malls/shopping centres, metro stations.

8.2   Each museum may promote their USP/ activities.

8.3   New and exciting merchandise in shops like ties, cuff-links, T-shirts, key chains, jewellery, replicas, prints, postcards, albums etc. Tie up with vendors for this work.

8.4   Approach corporate to popularize museum culture through gifts.

8.5   Museums are not being marketed properly-strong social presence needs to be developed by them, links with tour operators, monthly advertisements of museum activities in electronic media and newspapers, development of members/museums friends needs to be taken up.

8.6 Celebrate regularly "World Days", "State Functions" and "Special Events".

8.7   More exhibitions will also help in bringing about an increase in the number of visitors, even if these are ticketed.

8.8   Attract corporate sponsors with special exhibitions for their clients.

9. Capacity Building

9.1   Organise HRD training & expose personnel to international standards.

9.2   Encourage courses and exchanges of best practices, through visits. Facilitate studies, researches to bring out better publications.

9.3   Utilize visiting fellows to unravel treasures within museums. Publish world-class books & catalogues through the best available.

9.4   Collaborate with national and international institutions to enhance their capacity. Engage specialized professionals on contract/tenure basis formulation.

9.5   Short training and certificate courses may also be run by the NMI.

9.6   In-service training courses for mid career up-gradation of Museum professionals may also be run by the NMI.

9.7   NMI may develop mechanism (like Whatsapp/Facebook group etc.) for sharing knowledge/information among curators/fellow (who are going to attend international fellowship programme of the MOC) on modern practices so as to improve outcome of galleries/exhibitions. These follows may act as trainer for other for which NMI may arrange workshop /seminar where these fellows may be called up to share their knowledge /experience with other Museum professions.

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Sardar Vallabhbhai Patel:
Builder of India's Steel Frame

Dr. Saumitra Mohan

Abstract

Sardar Vallabhbhai Patel was a mass leader, politician, administrator and an astute diplomat. A patriot to the core, Sardar Patel was imbued with practical sagacity and ranks amongst the greatest architects of free India. The contribution of Sardar Vallabhbhai Patel, known as the 'Iron Man of India' to the Indian Freedom struggle has been remarkable and incomparable. A man of sharp intellect and character, he has been an immense source of inspiration not only during the Indian freedom movement, but also in the present times.

Owing to his contributions to the India's freedom struggle, building of the Indian State, its subsequent consolidation and laying the foundation of India's elaborate system of governance, Sardar Patel is deeply etched in the memory of every Indian. An average Indian adores the icon and legend called Sardar Patel for his selfless service to the nation. But one thing for which everyone interested in India's success as an independent State, and the efficiency of its governance system knows, that the same would not have been possible, but, for its strong bureaucracy. It is here, that the fine imprint of Sardar Patel's legacy and contribution should be noticed and appreciated.

Sardar Patel's role in consolidating Indian State:

In what has become Sardar Patel's most lasting legacy, he stitched together 565 disparate princely States along with the British Indian territories, thereby preventing the balkanisation of India. The British, while granting India's independence, had also left it to the sweet will of hundreds of princely States to decide for themselves as to whether they wished to remain an independent State or would accede to India. It was Sardar Patel who, through his painstaking, nuanced diplomacy and strong action, ensured that a new India emerge effortlessly within the framework of a constitutional democracy.

Through a bloodless revolution unprecedented in world history, he welded the disparate princely States together with the rest of the country. He not only built up the unity of this great land of ours, but, also laid down the foundations of a true democracy. Sardar Patel, thus, united and consolidated separate States of the country, trapped in over 200 years of slavery and integrated them as inseparable parts of independent India. The manner in which he won over for India the loyalty of princely States and the services was a marvellous piece

of statesmanship. India's first President Dr. Rajendra Prasad rightly notes in his diary, "That there is today an India to think and talk about is very largely due to Sardar Patel's statesmanship and firm administration."

Sardar's Socio-Economic Outlook:

While Patel was highly influenced by Mohandas Karamchand Gandhi and continued to remain associated with the latter during India's freedom movement, he did not identify himself completely with Gandhi's moral convictions and ideals. He had his own vision and convictions which stemmed from his education, knowledge of law and philosophy, experience in governance and politics. He, in fact, regarded Gandhi's emphasis on their universal application as irrelevant to India's immediate political, economic, and social problems. Sardar Patel was considered practical, decisive, and even ruthless. The British Government often found him dangerous to their imperial interests.

Patel also disagreed with Jawaharlal Nehru on the need to bring about economic and social changes by coercion. Unlike Nehru's emphasis on socialism and dirigisme, Sardar Patel believed in free enterprise. This helped him in gaining not only the trust of conservative elements from the Indian society, but in also mobilising the funds required for sustaining the activities of the Indian National Congress. Paying tribute to him, Nehru called Sardar 'the builder and consolidator of new India.' Even though Nehru and Patel differed on many issues confronting the nascent Indian nation, the two, however, never allowed the mutual differences to compromise India's governance.

Patel in post-independence India:

The formation of the post-independence nation out of the loose political structure of India after the departure of the British was a crucial phase in modern Indian History. It was India's good luck to have principled visionary leaders at the top during its formative years. Sardar Parel was definitely one such leader who guided India through a very critical time. It is rare in history to have a combination of outstanding statesmanship with genius for administration.

It was India's good fortune that at the most crucial stage of its modern history, she had in Sardar Patel a combination of the vision of a statesman with the sagacity and practical outlook of an administrator. Sardar Patel's empirical insights gained during his days in Ahmedabad municipal bodies and his regular interactions with civil servants came handy while visualising and conceiving India's governance structure. Without his leadership and active involvement, the Indian administrative system might not have been revitalised. In fact, its standards might well have fallen below the requisite standards something that the critical times and the formative years in a new nation earnestly required.

Sardar's Association and Engagement with the Indian Civil Service:

Fortunately, the nation had Sardar Patel in its most difficult times. It was he who would go on to establish the modern Civil Service, which remains the bedrock of the Indian administration till this day. Patel's association with the civil servants extends long before he took over as the Home Minister of the interim Indian government after its independence on the fateful day of 15 August, 1947.

It is very well-known that before Patel actually stepped into India's freedom struggle and started actively participating in various related movements and activities; he was a very successful barrister in Ahmedabad. As such, Patel often dealt with the British civil servants on issues concerning law and order in the city. However, his real engagement with the British ICS (Indian Civil Service) came when he was elected to the Ahmedabad municipality. As a true administrator, Patel actively sought and received the cooperation of experienced British ICS officers. He successfully coordinated different activities with them for fulfilling his official obligations and this aptly brought out his administrative acumen.

Understanding the importance of an efficient Civil Service:

It was Sardar's vast experiences in administration that helped him realise the true importance of Indian civil servants who had worked with great loyalty under the British rulers. He understood that after partition when the British officers leave the country, there was going to be an administrative vacuum as we did not have enough experienced and efficient civil servants to administer a vast and diverse country like India. Patel realised that if those experienced civil servants were not taken into confidence and retained in service, there would be practically no good administrator left and the same would hugely compromise the different State-building and nation-building exercises required to consolidate a young nation's administrative foundations.

Despite staunch opposition from a number of influential Indian leaders and freedom fighters, Patel began building a team of efficient and competent officers who would shape and prop up the nation's administrative machinery. Working through these turbulent times with this team of civil servants further strengthened the conviction in his mind that they were indispensable. Understanding how critical they were to the entire nation-building processes, Patel took the Gandhian route of accommodation and adjustment by welcoming them with open arms.

Overcoming the initial distrust of civil servants:

As suggested above, the Civil Service of the pre-independence period was an anathema to the then nationalist leadership. As was true with other nationalist leaders, Sardar Patel too was highly skeptical and critical of the colonial Civil Service. As President of the Indian National Congress in 1931, he insisted on 'a heavy reduction in the Civil Service expenditure and a consequent reduction in the emoluments of the Civil Service'. Shortly before independence, he

expressed his unhappiness with the Civil Service in the Constituent Assembly. Nevertheless, Patel's decision to retain officers of the old ICS was vehemently opposed by many leaders of the freedom struggle. Those opposing retention of the ICS officers believed they weren't trustworthy because of their association with a reviled and ruthless British Raj. After all, it is the same civil servants who had actively participated in the arrest and harassment of Indian freedom fighters while the British called the shots. Even India's first Prime Minister Jawaharlal Nehru was not very keen on retaining them.

In the Constituent Assembly debates, arguments on the subject often reached boiling point, but Patel, however, remained unmoved. Patel held the fort and eventually had his way. He said, "I tell you, do not quarrel with the instruments with which you want to work." As an experienced and grounded leader, Patel knew how much this country needed the whole-hearted involvement of these civil servants in different developmental and governmental initiatives in the days ahead.

All this happened just few months before Independence. But after independence, Sardar Patel modified his views and began regarding the Civil Service as an invaluable institution whose members were worthy of trust as advisors and administrators. While acknowledging the yeoman service rendered by the Indian civil servants during the critical years following India's independence, Sardar Patel waxed eloquent in an address to the Constituent Assembly of India on October 10, 1949. He said,

I wish to assure you that I have worked with them (civil servants) during this difficult period. I am speaking with a heavy sense of responsibility and I must confess that in point of patriotism, in point of loyalty, in point of sincerity, and in point of ability, they cannot have a substitute. They are as good as ourselves... I wish to place it on record in this House that if, during the last two or three years, most of the members of the services had not behaved particularly and with loyalty, the Union would have collapsed.

Sardar Patel was of the opinion that but for a good All-India Service, India would not survive as one nation. Patel was clearly convinced and conscious of the fact that the independent India needed 'a steel frame to run its civil, military, and administrative bureaucracy'. His faith in the institutional mechanisms like having an organised command-based army and a systematised bureaucracy has proved to be a blessing. It's India's efficient, effective and professionally-trained bureaucracy which has been one of the major reasons for the success of India's parliamentary democracy notwithstanding having a highly plural, inegalitarian and multi-layered diverse society.

Building the foundation of Indian administrative structure:

The manner in which Patel won over for India the loyalty of the services to consolidate the new-born freedom was a marvellous piece of statesmanship. It

wasn't just a case of greeting the ICS with open arms, but also instituting a necessary structural framework for their functioning while also offering them constitutional safeguards for meeting the requirements of a new India.

Recruitment to the Indian Civil and the Indian Police Services was first slowed down and then stopped because of the war. The likelihood of a constitutional change resulting in wide gaps in those services was yet another reason. In the meantime, there had been considerable dilution of standards in terms of qualifications, mode of recruitment, quality and capacity-building as a result of large numbers of ad-hoc appointments to other services. The preoccupation with works connected with war and civil supplies had caused neglect and dislocation in the normal activities of the government. The administrative structure was there, but the same existed in a weakened and attenuated State. The administration, as a whole, was generally in disarray and in a rundown condition.

Uncertainty and ambiguity about the impending constitutional changes, and its effect on their own future had tended to affect the enthusiasm and self-confidence of the senior Civil Services. There was, further, the rising tide of communalism with ominous potential of violence. This had brought in extraneous considerations in the working of the then bureaucracy which was in a much disoriented shape. This was the background of the administrative situation which Sardar Patel as the Home Minister in the interim government faced in 1946.

As the year 1945 advanced and the constitutional negotiations took their tortuous course, Sardar Patel started thinking of the future. The Muslim League's firm thinking was that if India was to remain united, it could only be on the basis of a weak Centre with its jurisdiction limited to External Affairs, Defence, and Communications. There was no scope in such a constitutional arrangement for any All-India Administrative or Police Service.

By October 1945, Sardar Patel had come to the conclusion that with the intransigent attitude of the Muslim League, partition was probably unavoidable. Against this background, Sardar Patel realised that India must have its own new services as successors to the ICS and IP for building an India in accordance with the ideals and visions that informed Indian freedom movement and as would subsequently be enshrined in independent India's democratic Constitution. This, apart from filling the existing wide gaps in these services, would contribute to the unity of the country while also adding to the strength of its administrative structure.

The first momentous step he took in this regard was to have a resolution adopted at a Conference of the Congress Chief Ministers (in spite of vehement opposition from some of them) in October, 1945 authorising the setting up of two All-India Services namely the IAS (Indian Administrative Service) and the IPS (Indian Police Service) to succeed the ICS and IP of pre-independence

vintage. The nomenclature 'All-India Service' was coined by the M.E. Gauntlet Committee on Division of Functions in 1918 when the Government of India Act, 1919 was framed and promulgated.

Rationale for the Civil Services:

The contemporaneous documents also indicate that Sardar Patel was acutely conscious of the historical and cultural factors, and of the debilitating effect of a long period of subjection on the moral fibre of the Indian people. Such factors were likely to make India a "soft" State, making it vulnerable to policy and administrative vacillation in critical situations or when faced with difficult options. Sardar Patel had a deep understanding of the lessons learnt from the Indian history. Regional and other narrow loyalties in India had often led to chronic divisiveness have had free play in the periods of absence of a central authority or its weakness. His experience of dealing with the Congress organisation and of the Provincial Ministries had strengthened his apprehensions.

Sardar Patel was convinced that All-India Services for general and law and order administration would be valuable adjuncts to a strong constitutional authority at the Centre. This, however, had to be consistent with the federalism of our Constitution, of which he was to be one of the main architects. Sardar Patel did, therefore, believe that it was essential for independent India's administrative machinery to have a strong frame with strong capabilities for withstanding stresses.

He wanted the Indian Civil Services to have the capacity and capability of maintaining discipline in administration as well as peace and order in the society. For decades, the ICS and IP had been referred as the 'steel frame' of imperial rule. But Sardar Patel conceived of the successor services in a role fundamentally different in objectives and style of functioning while simultaneously retaining the element of firmness. He wanted the services to remain in sync with the new ideals and visions of new India.

Role and Mission of Civil Services in independent India:

They were to be the servants of the Indian people, unfaltering in their loyalty to the country while being dedicated to the ideals of the Indian Constitution. They were expected to execute different developmental programmes and schemes with devotion in accordance with the laws and policies of the Central and provincial governments in new India. Sardar Patel laid down the broad principles on which entrants to the Indian Administrative Service were to be trained.

The civil servants in newly-independent India were to be moulded into patriotic Indians and not as English country gentlemen. They were no longer expected to be oriented to working as agents of an imperial rule as had been the aim even for the Indians in the ICS. They were to have an All-India and not a

parochial outlook. They were to have an understanding of our past, deeper appreciation of the Indian culture and social conditions and multifarious requirements for building a new progressive State with equal opportunities for all its citizens. They were to facilitate India's rise as a developed and progressive democracy in the Comity of Nations.

"Sardar's heart was big enough to appreciate merit and he wanted the services to be steadfast to their traditions of efficiency, impartiality and equality", writes KL Punjabi, author of 'Life and Work of Sardar Vallabhbhai Patel'. Sardar Patel had his finger on the pulse of the people as he had his grip on administrators. It was his vision that Indian Civil Service becomes a strong tool in strengthening the cohesion and national unity in India.

Sardar Patel wanted a strong and vibrant federal administrative system in which the All-India Services would play an important role. True to his conviction, the Civil Services have provided the requisite framework for an effective administration of the country. The values of integrity, impartiality and merit remain the guiding principles of the Civil Services and that is how it ought to be.

Consolidating Indian Unity and Nation-building:

At the dawn of independence in 1947, when the nation was faced with many problems, ensuring its unity amid a mind-boggling diversity was indeed a great challenge. It is here that India's Civil Services played their historic role in nurturing the processes of national cohesion and strengthening the bonds of unity and integrity. Indian civil servants have played multiple roles in the initial years of our nation-building process. A wide range of tasks spanning a variety of knowledge domains were undertaken for completion by civil servants as the country had a severe shortage of trained personnel in many areas.

In addition to performing their main role as administrators, the civil servants took upon many specialist roles in different fields. It was the requirement of the time and they rose to the occasion. However, there was a larger role expected of Indian bureaucracy. Our national leaders like Jawaharlal Nehru and Sardar Patel viewed the All-India Services as a group of professionals who would take a long-term view of the national needs and priorities.

While the local administration would focus on day-to-day issues of governance, the All-India Services (AIS) were charged with the responsibility of building a nascent nation while factoring the various constraints and challenges stacked against it. The AIS have ensured that India not only marched from strength to strength through its multiple crises on the road to its glorious present; they have also ensured the inculcation of robust national feeling among its citizens. This role got only reinforced with the emergence of strong democratic forces in the immediate aftermath of India's independence. India's evolution as a strong economy and vibrant democracy is a testimony to

the great contributions of India's Civil Services under the stewardship of its elected governments.

Delineating the contours of All-India Services:

As per the framework put forward by the Cabinet Mission Plan in 1946, the erstwhile British Civil Services were to be abolished once the transfer of power got in motion, leaving Indian officers of the ICS in a spot. The British Foreign Secretary had argued that members of ICS could choose to stay in service or leave once the transfer of power materialises. On October 10, 1946, a meeting was called between the Prime Ministers of the various British India provinces to discuss the functioning of the administrative machinery following the transfer of power under the chairmanship of Sardar Patel, head of the Home Department in the interim Government.

Sardar Patel felt that if the old ICS cadre was replaced by a new cadre like the IAS and IPS, there would be a psychological effect on the Indian people. They would welcome the new thinking and outlook. To avoid constitutional and political complications, he introduced the new services as per the requirements of the new Indian State. Although Nehru and the likes finally came onboard for the replacement of the ICS with an All-India Service, a point of difference emerged on the recruitment and executive control of these officers. The bone of contention also included as to whether the Central or provincial governments would exercise control over them. Provincial autonomy was a major issue considering the diverse communities that inhabited the Indian Union.

G.B. Pant, a prominent leader of the Indian freedom struggle from Uttar Pradesh, wasn't very keen on the idea of an All-India Service, while T. Prakasam of Madras Province sought the complete control of these civil servants under provincial governments, including powers of recruitment and dismissal from service. However, Patel remained firm in his position. While he recognised the imperative of adequate allowance for provincial susceptibilities, but still considered the centrally-controlled All-India Services important.

The new set-up provided for organising an All-India Administrative Services in line with the previous ICS and a provincial service under the control of the provincial government. It was suggested that the officers of the Provincial Services would be promoted to Central Services on quota and seniority basis. The IAS was suggested to be recruited and controlled by the Federal (Union) Public Service Commission of the Union Government, though the officers might be deputed and posted in different provinces. He believed Central control over the provinces was necessary for maintaining India's integrity.

Once the contours of this new administrative system were established, serious planning went into determining the process of recruitment, training, posting

and payment of salaries. Similar arrangements were also put in place for civil servants working in other departments of the government. The interim shortfall in the number of officers was overcome by promoting officers from the Provincial Services and recruiting personnel from the war services. Such foresight allowed Patel and his team of civil servants to overcome the turbulence that came with the transfer of power.

Crafting Constitutional Safeguards for the Civil Services:

Another sterling contribution of Patel to the Indian bureaucracy was his steadfast determination to ensure adequate constitutional safeguards and guarantees for the civil servants, following their yeoman service to the nation in turbulent times. He succeeded in incorporating Article 312 in the Constitution, thus, endowing the All-India Service with a constitutional sanctity. This was to ensure the latter full protection necessary for its fearless functioning without much intervention. Accordingly, special safeguards for the Civil Services were inserted into the Constitution under Article 312 (2) in Part XIV, giving birth to the modern IAS and IPS.

In October 1951, the Indian Parliament passed the All-India Services Act, which laid down the rules of recruitment and service conditions. Patel, unfortunately, passed away on December 15, 1950, nearly a full year before the All-India Services Act was passed in the Parliament. However, by then, Patel had already established an institution that has stood the test of time producing officers with a range of capabilities to oversee different aspects of Indian administration.

Roles and responsibilities of Civil Services:

Sardar Vallabhbhai Patel, while speaking to the first batch of Indian Administrative Service officers at Metcalf House in Delhi on April 21, 1947, had outlined the civil servants' tasks in an independent India and laid down certain principles of 'Surajya' or good governance.

"Your predecessors were brought up in the traditions in which they kept themselves aloof from the common run of the people. It will be your bounden duty to treat the common men in India as your own."

Sardar Patel regarded the Civil Service as an invaluable partner in the task of governance in independent India. He openly exhorted the civil servants to function fearlessly and professionally in their relationship with the ministers. He declared,

"Today, my Secretary can write a note opposed to my views. I have given that freedom, to all my secretaries. I have told them, 'If you do not give your honest opinion for fear that it will displease your Minister, please then you better go. I will bring another Secretary… I will never be displeased over a frank expression of opinion."

April 21 has since then been celebrated as the 'Civil Services Day'.

Patel went on to advise the young bureaucrats to consider it as their

"…bounden duty to treat the common men in India as your own, or to put it correctly, to feel yourself to be one of them and amongst them, and you will have to learn not to despise or to disregard them. In other words, you will have to adopt yourselves to democratic ways of administration and to, uphold throughout your service, its dignity, integrity and incorruptibility."

He further advised them to maintain the utmost impartiality and incorruptibility of administration. "A civil servant cannot afford to, and must not, take part in politics. Nor must he involve himself in communal wrangles," he said. He believed that, "to depart from the path of rectitude in either of these respects is to debase public service and to lower its dignity." That is why, he told them, "Render your service without fear or favour and without any expectation of extraneous rewards".

Sardar Patel and modern Indian Civil Services:

Today, the All-India Service is the name of the Civil Service which is recruited and initially trained by the Union Public Service Commission as an independent body under the Government of India. But this is common to both the levels of government, and serve both of them i.e. the Central and the State governments. Its members are allocated to a provincial (or, State) government, but can rotate between the Government of India and the government of his/her allotted cadre. The experiences and insights gained during their field postings come handy during their role as policy-makers.

That Sardar Patel is relevant even today is proved by the fact of his being remembered every time the nation is faced with a constitutional or political crisis. His name immediately comes to mind as one who could have rid us of the sundry problems before us. Patel's legend and legacy continue to grow and with every passing year it glows brighter.

Patel was a selfless leader, who placed the country's interests above everything else and shaped India's destiny with single-minded devotion. The invaluable contribution of Sardar Vallabhbhai Patel in building a modern and unified India needs to be remembered by every Indian as the country marches ahead as one of the largest democracies in the world. The Indian State remains beholden to the legacies of Sardar Patel and it is only hoped that the Indian Civil Services, as visualised by him, shall continue to contribute tirelessly to the socio-economic development of its countrymen. It is also the bounden duty of every Indian citizen to remain true to the ideals and visions that Sardar Patel espoused and fought for.

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Construction of a Major Regulator in the Cauvery River - Tamil Nadu

Dr. M. Balaji

Abstract

The Upper regulator across the river Cauvery at Mukkombu, Tiruchi, was nearly 200 years old when it was washed away during the unprecedented flood in 2018. It is only with this regulator that irrigating the nine delta districts of Tamil Nādu is possible, and the rice production from these districts is nearly 6 LMT. The Cauvery River water dispute between Tamil Nadu and Karnataka has been fiercely fought for the last 150 years, Tamil Nādu being the lower riparian and water deficit state; every drop of the Cauvery River is considered valuable. The collapse of this regulator became a formidable challenge to the Government and the farmers of these districts. Four lakh cusecs of water drained into the sea after the collapse of the regulator. The case study narrates the challenges faced by the Government in restoring irrigation through temporary restoration and permanent construction of a new regulator and gaining back the confidence of the farmers and citizens of the State.

Introduction

The Cauvery River originates in Talakaveri, Coorg District of Karnataka. It splits into two branches at Upper Regulator, near Mokkombu, Tiruchi, 177 km downstream of Mettur Dam as Coleroon and Cauvery. The Upper Regulator was constructed in 1836 by Sir Arthur Thomas Cotton and remodeled in 1902 (Figure 1). The Northern branch, the Coleroon river, serves as a flood carrier, and the Southern branch, the Cauvery River, carries water to irrigate nine delta districts in Tamil Nadu. During the irrigation period, shutters of a barrage across Coleroon are regulated to head up and divert water for irrigation through Cauvery. The excess flood water received from Karnataka is released from Mettur Dam. 1 (Stanley Reservoir) after attaining its Full Reservoir Level (FRL). There was a heavy down pour in the Cauvery catchment in Karnataka in June and July 2018, which resulted in a sudden surge of water level, and around 3- 4 lakh cusecs of water was gushing through the Upper Regulator for about a few days. The water gushing through was nine times higher than the usual flow rate. On 22.08.2018, at around 11.30 pm, the piers and shutters of eight vents and aprons of the Regulator collapsed and were washed away (Figure2). The entire river flowed through the breached portion, causing a

deeper scouring of the riverbed up to 10m. The sudden collapse of vents in the Upper Regulator led to the partial closure of Mettur Dam and threw up the water supply regulation to wind and cultivation in 12.58 lakh acres in delta districts became a formidable challenge.

Background

It is pertinent to mention that the Cauvery interstate water dispute between Tamil Nadu and Karnataka is a long-fought political and legal battle and has severe implications for the State's agricultural and political economies. A few months before the collapse of the Upper Regulator, the Supreme Court of India had delivered a verdict allocating a water share of 404.25 tmc ft 2 and 284.75 tmc ft to Tamil Nadu and Karnataka. The water share of 404.25 tmc ft meant for Tamil Nadu had to be regulated through the Upper Regulator for about eight months in a calendar year, producing around 6 LMT of paddy and livelihood of lakhs of farmers dependent on a timely supply of water to all the delta districts. With the collapse of the 190-year-old Regulator, farmer's associations and pressure groups across the State had started protest marches, agitations, and picketing; NGOs, and civil rights activists, also joined the bandwagon. Major political parties and their leaders, one after the other, camped at the vintage site and traded charges of ineptitude, and of the Government being insensitive to the plight of farmers. They also blamed ram pants and mining in the river bed as the primary cause for the collapse of the Regulator and admonished the Government for having squandered the precious hard-won riparian rights. The political ambience in the State reached its boiling point (Figures 3 and 4). Since the media's appetite to dissect an issue and question the Government is always gluttonous, they passionately did that. After these developments, the Chief Minister announced the construction of a new modern regulator, replacing the two-century-old brick and lime mortar masonry structure.

Managing the crisis

Tamil Nadu Government appointed an IAS officer of the 2005 batch on 24-09-2018 as Additional Secretary (Delta irrigation) in the Public Works Department (herein after ADS) to resolve the impending crisis. Chief Secretary to Government instructed him to draw up a strategic plant ore solve all the issues and make concerted efforts to achieve the results expeditiously. Chief Minister advised him that the restoration of the existing Regulator, regulation of water supply to the delta districts, and process for constructing a new Regulator should be carried out, giving no scope for complaints and irregularities. The ADS understood the grim situation prevailing across the State and the pressure on the Government. He immediately undertook a whirl wind field tour of the nine delta districts and met farmers, their

representatives, farm laborers, public representatives, district officials, and media to assess and grasp the enormity of the problem (Figure 5).

The farmers had sowed seeds a fortnight ago, were expecting a water supply for the first wetting of the paddy field, which is crucial for the initial sustenance of the crop, but with this catastrophe dark shadows loomed over the prospectus of winter crop. The irrigation channels ran 15589 km through the A and B channels.[3] to reach the agricultural fields, and it had to be regulated by 76 tail-endregulators in 70 places. The delta districts were divided into three basins, Cauvery, Vennar, and the Grand Anaicut canal, and had 702 tanks of varying capacities. The temporary restoration work of the damaged portion at the Upper Regulator site became arduous with each passing day. More than10000 cusecs of precious water were draining into the sea daily. Given the grim situation, the immediate priority was to resume supply through the collapsed Regulator for irrigation. Still, it had a high risk of running into another profound crisis if it damaged the structure further.

Challenges on the Road ahead

The ADS was confounded with many administrative and execution challenges. First, his position was only to assist the Secretary of the Government, not that of a field office, and he had to work under the overall control and supervision of the Secretary. The well-established administrative practice was that the subordinate official, including Engineer–in–Chief, Chief Engineers, and down the level, took instructions from the Government, which were issued only by the Secretary. So, he found his position was quite precarious, full of responsibilities and high expectations but with no authority. Second, there was subtle squabbling between the planning and execution wings of the PWD. Execution wings are the more sought-after positions than the planning and formulation wing. The correspondence between these two wings was so cumbersome and time-consuming that even a small checkdam project worth a few lakhs would take months or even years to get the necessary approval. Projects similar to the proposed Regulator had taken not less than one year for administrative approval in the past.

Third, the department was already mired in several controversies, allegations of rent-seekingand inordinate delay in the execution of projects. Officers with integrity and competence were a rare sight. Fourth, in-house estimation and design had become so outdated that modern project conceptualisation was foreign to the planning wing. Fifth, there was a huge perception and communication gap between the farmers and engineers, and most of the farmers felt that the engineers were in sensitive towards their plight and not accessible. Sixth, restoration and construction of this scale required external consultation and expertise so that the design, planning, and execution are of

the highest standard, but such a process would take a lot of time. Seven, the window time available for construction across such major rivers is only five months in any calendar year, i.e., February to June (non-irrigation period). Therefore, preparing a Detailed Project Report (DPR), estimate finalisation, Global Tender process, fund mobilization and administrative sanctions within four months appeared as an uphill task.

Execution with alacrity

The ADS consulted a few fastidiously upright and competent senior IAS officers and quickly firmed up an operational plan that a team of experienced and upright officers in the PWD to be constituted to monitor the DPR and estimate preparation. The plan also detailed a couple of teams to design the new Regulator, conduct field testing, prepare tender documents, and monitor the temporary and semi-permanent restoration works. And also, appoint CUBE IIT Madras 4as an external agency to validate the design for the new Regulator and provide technical strategies towards temporary restoration works. ADS wanted to induct an expert from CMRL[5] to finalise the nature of execution (i.e., Design and built/ Design, Built and Transfer/ EPC6). ADS was firm that the tendering process and conditions should be such that only the best infrastructure firms participate to ensure quality and timely completion. On 01-10-2018, ADS met the Chief Minister, with these proposals prepared and ready. The Chief Minister readily agreed to all the proposals and further directed him to monitor the execution very closely. Chief Secretary also appreciated his prompt assessment of the issues at hand and for coming out with workable solutions.

Delivering the laid-out action plan requires a distinct set of skills. The friction between the existing team of engineers and the newly constituted teams kept coming to the fore, and the induction of CUBE, IIT Madras, as a monitoring and validating agency was seen as an attempt to undermine the expertise of the senior engineers of the department. To that extent, there was significant foot-dragging by senior officials, and resistance was slowly building up. However, there were only 110 days left to complete the entire work. In February 2019, enforcement of the model code of conduct for the parliamentary elections was expected, and tenders had to be finalised before the end of December 2018. Constrained by these limitations, ADS had put in place an integrated approach of the "Wheel and Spoke model "by which every member of the team had to execute his part as communicated to him in a Gantt chart and push it to the members of the other teams where it would get either assembled or become a subset of another bigger set for further processing. The loop would thus continue until every stage of the subset was completed and assembled. The resources (men and material) were added to the next level as

and when a subset was completed by which not alone it followed a critical path. Still, the completion rate of each activity went up very fast.

Completion-Just in Time

A coffer dam[7] on the damaged side of the Upper Regulator was built by erecting casurna MS pipe piles with sandbags, and a stone coffer dam wall was also built by dumping boulders along the apron, which arrested the concentrated sub-surface flow through the broken portion, and it acted as a composite weir to surplus the river flow (Figure 6). The water supply for irrigation was stepped up slowly, and by 05-10-2018, the total supply along the damaged Regulator was restored. ADS prepared a scheme for water regulation by which the asymmetric information condition prevailed on water release and supply at 76 regulators was resolved. Equitable water distribution was planned methodologically based on the supply and demand through 343 river nodes. A strong feedback channel with user groups and farmers was set up, and it built pressure on the field engineers to be on their toes and start addressing even a minor distribution issue with great care and attention. CUBE, IIT Madras, and the irrigation wing did a geotechnical study, which revealed that heavy river flow would create additional hydrodynamic load on the temporary structure; therefore, construction of a combined pile wall system in the upstream and downstream up to a depth of 12m from the existing sill level was mandatory as the completion of the new Regulator would take another two years, and the recommendation of CUBE IIT Madras was immediately accepted. A tender was finalised for erecting omega sheet piles, and work began as planned on 01-12-2018 (Figure 7). The monitoring team for the estimates did their job diligently, by which the cost was pruned down to Rs 45.24 Cr by cutting down several layers of unwarranted expenditure in the estimate.

The design team, along with CUBE, IIT Madras, was working round the clock to finalise the hydraulic and structural design for the construction of the new Regulator. The bed protection, surface flow calculations, design for pile cap, hydraulic gate design, single-lane bridge, pier, abutment design, and aesthetic part of the Regulator went into several loops of field works, deliberations, and alterations. Finally, after administrative approval, a global tender was floated on 30-12-2018. Again, the estimate monitoring team did a fantastic job by pruning down the estimate to Rs 367Cr after several rounds of verification. NABARD[8], after a detailed examination, provided the funds for the project. Had they followed the 'waterfall model approach[9], a project of this size would have taken not less than one year even to reach the stage of administrative approval considering past experiences. The synergy was slowly building up between members of different teams, and everyone started contributing more

as the environment enabled them to share their ideas frankly and showcase their skills and expertise. Appreciation started pouring in from farmers, the public, and the media for the extraordinary commitment and hard work displayed by the field engineers in resolving the crisis rapidly, and PWD irrigation engineers were quite excited about it. The tender was awarded to one of the reputed infrastructure firms in India, and the foundation stone for the new Regulator was laid on 26-02- 2019 (Figure 8). It brought much-needed relief to the Government, and the farmers showered praise for the accomplishment.

Figure 1: Upper Regulator Before the collapse

Figure 2: Collapsed Regulator

Figure 3: Then Chief Minister visit to the site

Figure 4: Then Opposition leader and the present Chief Minister visit the spot

Figure 5: ADS inspection of the Upper Regulator

Figure 6: Coffer Dam Construction

Figure 7: Sheet pile - combined pile system

Figure 8: New Regulator construction

References

[1] It was built in 1934 and is the largest dam with a maximum capacity of 93tmcft.

[2] It is unit flow measurement - one cubic foot per second. A unit used to measure the volume of river flow- one thousand million cubic feet - 109 = 1 billion.

[3] The channels which carry water from the river are classified based on their width and depth into A and B.

[4] Centre for Urbanisation, buildings, and Environment- A centre of excellence in the IIT Madras.

[5] Chennai Metro Rail Ltd.

[6] Engineering Procurement and construction contract.

[7] A watertight enclosure enabling other construction work to be carried out below the waterline.

[8] National Bank for Agriculture and Rural Development.

[9] Breaking down the project activity and executing it in the sequence.

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Grievance Redressal & Public Accountability through Janmanch

Dr. Rajeev Bansal

Abstract

People, especially the poor residing in remote areas, always accuse in accessibility of the elected representatives, once they are elected to power echelons for the complaints, grievances and demands. Janmanch, People's Forum, has been conceived by Himachal Pradesh Government with the objective to identify and resolve grievances effectively especially of the underprivileged without any influence of bureaucracy and political pressure. The model comprises one-stop solution with an online system for reporting, time-bound action on grievances and public hearing chaired by Minister in a remote area. The paper has been attempted to evaluate the performance of Janmanch in terms of the redressal of grievances and services delivered to common people in 16 cycles of programme. The programme has not been appreciated by the officers whereas marginalised sections of society have found it a genuine platform to raise their voice. It was impressive to find that the initiative has evolved as a platform for the common people for public accountability of officials to get their grievances resolved besides being an instrumental step in strengthening of social contract between government and people. The State government should channelise solutions through amendments in the policies to pipe in time bound redressal of the repeatedly coming up grievances.

Introduction

People always accuse elected representatives for their inaccessibility since once they are elected to power echelons, they are hardly approachable for the complaints, grievances and demands, especially to the poor residing in remote areas. The democratic government is answerable and accountable to its people for public expenditure, taxes levied and to uphold the values of the constitution. The people charge government for delivery of services, right to be heard and time-bound action on the issues affecting their daily life. These elements are the core ingredients of social trust in democratic systems leading to social accountability and formation of social capital. In the past, many experiments like *'Prashasan Janta ke Dwar' 'Khula Darbar'* etc. have been tried but failed to yield effective results as the voice of citizens could hardly cross the barriers of bureaucratic fortification. *Janmanch*, a new model with an online

system for reporting, time-bound action of grievances and public hearing chaired by Minister in a remote area has been initiated by Himachal Pradesh Government as a one-stop solution. *"Janmanch"* has emerged as an innovative programme since the inception of idea with its occurrence in one or two assembly constituencies every month in all the 12 districts of State. The programme has a tremendous positive appreciation with on-the-spot and immediate redressal/disposal of grievances at the door step of public. The aim of this initiative has been to draw evidence-based understanding about different dimensions of programme implementation, disposal of grievances and demands besides looking for suitable measures for the solution to the problems of people.

The Genesis of Janmanch

Janmanch was conceived with the objective to identify and resolve public grievances especially of the underprivileged in an effective, equitable, accessible, friendly and inclusive manner with trickle down approach for the common people with a view to evolve a system for redressing their grievances and in entertaining public demands without any influence of bureaucracy and elected representatives, implementation of programmes and schemes with integrity and to deliver benefits and services to the intended beneficiaries; reduction in red tape in govt. offices by addressing grievances and demands at the door step of the community. It is further enabled for follow up with a holistic; 'e-samadhan', an information technology (IT) enabled approach to grievance redressal. The programme targets on the spot redressal of public grievances; delivery of citizen-centric services e.g. various kinds of certificates and completion of documentation under various schemes; saturation of selected govt. schemes such as 100% immunisation, 100% LPGfication, 100% piped drinking water supply to all households; physical inspection of operational schemes and ongoing works; receiving demands from the public for further processing and linking up with the local through hosting community meal for the all participating people.

> "Our Government believes in Government at the door step of the people. Therefore, I announce that all the Ministers of the State Government will regularly organise *"Janmanch"* in remote areas of every district to solve the problems of the people at the spot. The officers of all departments will be present to facilitate decision making and grievance redressal."
>
> Jai Ram Thakur,
> -Chief Minister, HP

Janmanch is organised in one assembly constituency in a month across all the twelve districts of the State. The Deputy Commissioners are responsible for

selection of the venue to cater to a catchment of up to ten *panchayats* with sizeable population strength at a place to accommodate the expected crowd and easy to access for citizens from remote and far flung areas with availability of public transport. Concerned elected representatives of all political parties are informed about the venue, date & time since they are special invitees.

Initiating the Process of *Janmanch*

The process of *Janmanch* includes the following activities:

i. **Publicity Campaign:** A publicity campaign, 15 - 20 days prior to the designated date of *Janmanch*, is launched, and citizens are informed of the venue in advance to facilitate them to submit their grievances/demands at least five days before the *Janmanch* for enabling backend processing by concerned offices who upload them on e-samadhan portal. The pre-Janmanch phase is used for saturating the catchment *panchayats* under various social development programmes on mandatory basis which include *Grihani Suvidha Yojana; Kisan* Credit Cards; Pension admissible for Old Age, Widows and Persons With Disabilities; Jan *Dhan Yojana; Beti Hai Anmol Yojna*; Digitised ration cards; Registration of expectant mothers and immunization besides construction and use of toilets in all households.

ii. **Preparatory Phase:** The preparatory phase is then used for launching a Sanitation Campaign in the eight to ten catchment *panchayats*. The Departments of Health & *Ayurveda* organise health camps at the venue with arrangements for medical checkup, tests, and medication. Besides this, all important schemes of the Govt. in the catchment area are inspected by departmental staff. The checklist of inspections duly filled up is submitted to the Deputy Commissioners along with photographs of the physical inspection. On similar lines, condition of roads, power supply, drainage, schools, institutions like health, veterinary dispensaries, public distribution system outlets are inspected.

iii. **Certificates, Documentation and Paperwork:** On *Janmanch* Day, where documentation is complete, certificates demanded viz. Himachali Certificate, SC/ST/Backward Classes certificate, Income Certificate, Copies of revenue records, Orchard card, are issued on the spot. The documentation/paperwork for fresh certificates requested is completed by *Janmanch* teams on the spot. To further facilitate the public for the procedural formalities for different welfare schemes and programmes, completion of paperwork is undertaken on the spot. Besides this, the paperwork is undertaken for attestation of mutations of land records, registration of recent births and deaths, preparation or renewal of ration cards, registration and attestation of documents/deeds where no extra fee is charged for registration at the camp in view of the public service.

iv. **Health Care:** Allopathic, Dental and *Ayurveda* Camps are organized for the Free Tests, OPD and Health check-up are undertaken at the *Janmanch* venue. The departments undertake advocacy of their developmental schemes with information, education and communication (IEC) material.

Janmanch **Day:** On the designated day, the Minister is provided the information on :-

- The constituency wise e-samadhan information showing status of grievances redressed.
- The update of redressal on public grievances/demands received 15 days prior to *Janmanch*.
- On the spot public grievances/demands received on *Janmanch* day which cannot be redressed simultaneously but will be uploaded on e-samadhan in next ten days.
- Status of saturation of schemes and social audit of ongoing schemes.
- Result of inspections of schemes conducted by Ministers on *Janmanch* day or on preceding day.
- Systematic collection of grievances and demands received on the spot to be ensured for entering into the e-samadhan portal subsequently for proper follow up.
- Certain demands/grievances which may need private hearing by the Minister.

In the open forum of public hearing, the members of community raise their grievances and the officers from the concerned departments respond to the status in front of all present. The situation sometimes become awkward for the responding officers as they are put to public answerability. The programme has not been appreciated by the officers in view of the emerging situation of public accountability in the presence of public and political leaders.

Data & Methods

The data was collected from *Him Pragati* website for 16 cycles of *Janmanch* programme held in the State from 3 June, 2018 to 2 February, 2020. The experiences of author as State observer in different *Janmanch* programmes have also been taken into account. The activities in the 16 cycles of *Janmanch* process have been presented in macro level in the respective sections. The data on saturation of schemes, activities of different departments, grievances and demands resolution has been analysed for assessment of the performance of the programme. The results have been drawn from the analyses of data with the evaluation criteria of REESI+E framework by Organisation for Economic Co-operation and Development (OECD) to assess the programmes against the criterion of Relevance, Efficiency, Effectiveness, Sustainability, Impact and Equity.

REESI+E framework

The basic objective of the REESI+E framework[2] is to assess the schemes against the criterion of Relevance, Efficiency, Effectiveness, Sustainability, Impact and Equity, using both secondary and primary data.
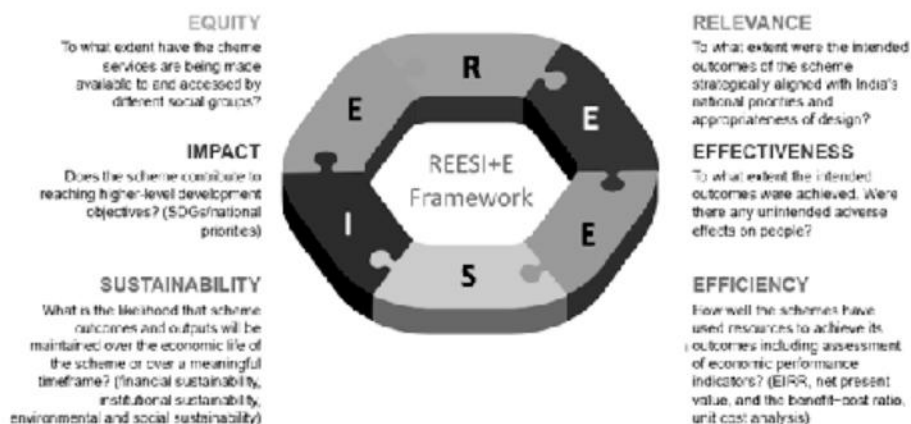

EQUITY
To what extent have the scheme services are being made available to and accessed by different social groups?

IMPACT
Does the scheme contribute to reaching higher-level development objectives? (SDGs/national priorities)

SUSTAINABILITY
What is the likelihood that scheme outcomes and outputs will be maintained over the economic life of the scheme or over a meaningful timeframe? (financial sustainability, institutional sustainability, environmental and social sustainability)

RELEVANCE
To what extent were the intended outcomes of the scheme strategically aligned with India's national priorities and appropriateness of design?

EFFECTIVENESS
To what extent the intended outcomes were achieved. Were there any unintended adverse effects on people?

EFFICIENCY
How well the schemes have used resources to achieve its outcomes including assessment of economic performance indicators? (EIRR, net present value, and the benefit-cost ratio, unit cost analysis)

Figure 1: Source: *Guidelines on Quick Assessment Studies, NITI AAYOG*

The suggestions for policy prescription generic solution have been made for strengthening of this mechanism for social accountability.

Results:

The abridged fact sheet of the *Janmanch* programmes organised till 2 February, 2021 are given in the Table 1.

| S. No.	Particular	Unit	Details
1.	Attended by Minister/Speaker/Dy Speaker etc.	No.	16
2.	Officers of District Administration	No.	1213
3.	Officers from line departments	Nos	5824
4.	Attended by Citizens from Public	Nos. in lakh	30.62
5.	Sanctioned Amount	Rs. In Lakh	258.96
6.	Expenditure incurred	Rs. In lakh	415.12

Source: *himpragati.nic.in*

It is evident that sizeable population, 30.62 lakh persons have attended the programme which had an expenditure of Rs. 415.12 lakh against the sanctioned amount of Rs. 258.96 lakh.

Inspection of Schemes/Works

The schemes and programmes of development departments that directly affects the socio-economic well-being of people especially Department of

Public Works, Irrigation & Public Health, Agriculture; Health & Family Welfare; Rural Development etc. were found to be areas of concern for the rural population at the grassroot level as evident from the information produced as under:

Figure2: Pre-Janmanch Activities
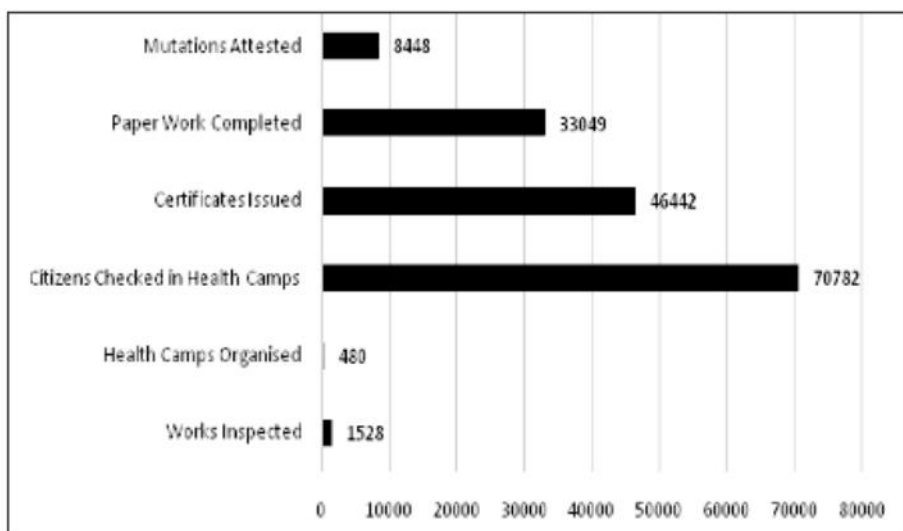
Source: *himpragati.nic.in*

In the 480 Health check-up camps organised in the remote areas afforded 70,782 persons to get themselves checked up in 16 cycles of programme who hardly an access to such health check-up facility. The revenue records e.g. mutation of land could be facilitated for 8,448 persons who could have been rather time and again visiting revenue officers for these works. The public in remote areas could get 46,442 different kind of certificates viz. income, caste etc. issued to them, whereas the formalities for issuance of certificates was completed in 33,049 cases without going to the concerned offices, a time and money consuming effort. The process has resulted into human development for the people residing in remote areas.

Summary of Saturation of Schemes

The schemes undertaken for saturation during the pre-Janmanch activities included social and women welfare, financial inclusion and public sanitation related with socio-economic development as presented below:

Figure3: Saturation of Schemes
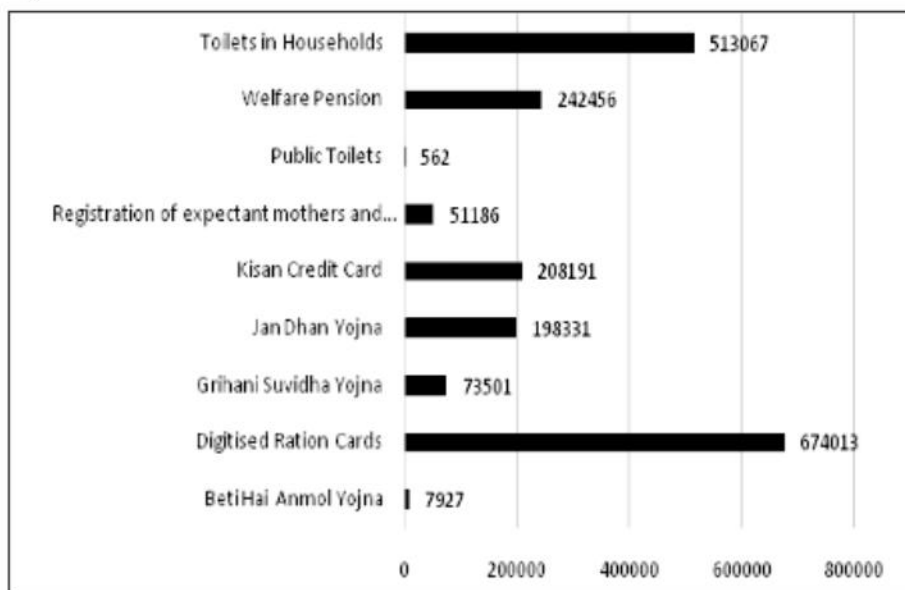
Source: *himpragati.nic.in*

The sizeable women population could reap the benefit through *Grihani Suvidha* (73,501 persons), welfare pension, including widow and old age pension (2,42,456 persons), and *Beti hai Anmol Yojna* (7,927 Girls). Besides this, financial inclusion was extended, and 5.13 lakh toilets were constructed in the rural households leading to safe hygiene and sanitation practices in the remote areas. The initiative addressed the concern for quality of life as well as an endeavour for sustainable economic, social and environmental development.

Summary of Grievances

The grievances which came up for resolution related to Public Works Department for repair and maintenance of roads; Irrigation & Public Health Department for supply of water for drinking and irrigation; HP State Electricity Board for providing domestic power supply connection or shifting of pole; Revenue Department for correction in land records, partition or mutation of land; Food & Civil Supplies Department for opening of fair price shop or regular supply of subsidized food grains under public distribution system, Rural Development Department of minor rural works; Social Justice & Empowerment Department of social security pensions and Police Department for law and order problems and have been presented in the Table 2:

Table 2: Department-wise Grievances

Sr No	Department	Received	Disposed	Percentage	No Action	In Progress	Pending
1.	Irrigation & Public Health	4112	4020	97.76	32	60	92
2.	Revenue Department	3701	3401	91.89	57	243	300
3.	Public Works Department	2498	2381	95.32	42	75	117
4.	Rural Development Department	2108	2045	97.01	34	29	63
5.	HPSEB Limited	1716	1636	95.34	35	45	80
6.	Social Justice & Empowerment	538	517	96.10	10	11	21
7.	Forest Department	428	402	93.93	11	15	26
8.	Police Department	428	421	98.36	1	6	7
9.	Food, Civil Supplies & Consumer Affairs Department	373	372	99.73	0	1	1
10.	Health & Family Welfare	370	352	95.14	8	10	18

Source: *himpragati.nic.in*

The department-wise status gives a bird's eye view of disposal and pendency of grievances. The maximum grievances related to social development departments except for land related matters of Revenue Department which has the discredit of maximum pending matters.

Figure4: Status of Grievances
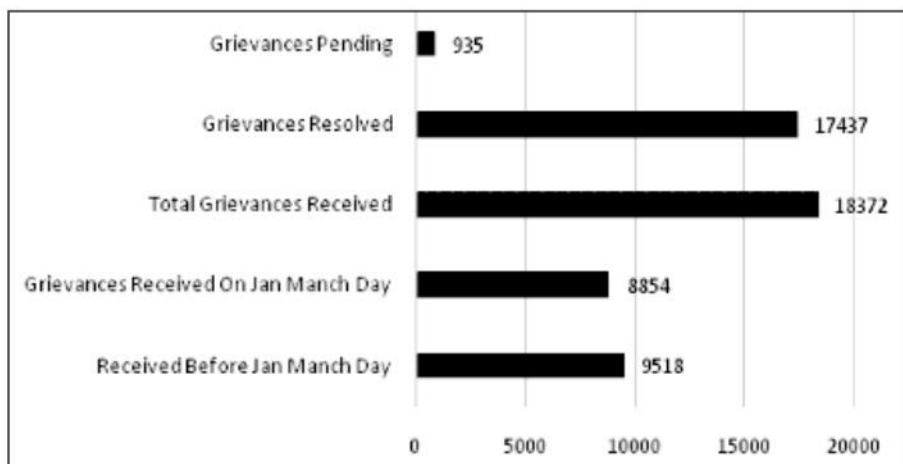
Source: *himpragati.nic.in*

The public hearing in *Janmanch* with on-the-spot remedial action/directions has resulted into resolution of 95% grievances escalated in different cycles, a proof of the strength of the programme. The reach of the programme and

efficacy in terms of resolution of grievances is an indicator of the success and credibility besides faith of the community.

Summary of Demands

The primary objective of the *Janmanch* Programme relates to resolution of grievances, but, the demands of people relating to socio-economic development are addressed additionally through this initiative. The grievances relate to commitments of social development programmes, whereas the demands include the expectations of people beyond the commitments through the policy or scheme. The major demands of the rural community related for the benefits from Rural Development Department; Irrigation & Public Health (IPH), Public Works; Revenue, HP State Electricity Board and Social Justice & Empowerment Departments. The demands raised by people of rural area included the works of smaller nature for the improvement in quality of daily life. The demands put forth to Department of Rural Development included construction of rural roads, inclusion into Below Poverty Line list, allocation of house from housing schemes, construction of water storage tanks, and land development for the purpose of cultivation. In case of IPH Department, the aspiration of people highlighted extension of irrigation channels or lift irrigation schemes and drinking water supply storage tanks. The demands from Department of Public Works included construction of new roads, metalling and tarring, patch work and drainage of existing roads.

Table 3: Department wise Demands

Sr No	Department	Received	Disposed	Percentage	No Action	In Progress	Pending
1.	Rural Development	6034	5359	88.81	267	408	675
2.	Irrigation & Public Health	5095	4863	95.45	118	114	232
3.	Public Works Department	3643	3307	90.78	201	135	336
4.	Revenue Department	3498	2546	72.78	550	402	952
5.	HPSEB Limited	1880	1705	90.69	101	74	175
6.	Social Justice & Empowerment	1068	971	90.92	46	51	97
7.	Health & Family Welfare	802	778	97.01	18	6	24
8.	Agriculture Department	788	755	95.81	11	22	33
9.	Food,Civil Supplies & Consumer Affairs	745	743	99.73	1	1	2
10.	Himachal Road Transport Corporation	587	569	96.93	2	16	18

Source: *himpragati.nic.in*

It is noteworthy to observe the pattern of department-wise status of demands that represent the analogy of resolution of grievances. Maximum 6034

demands were received related to Department of Rural Development which is the executing agency of this programme.

Figure 5: Status of Janmanch Demands
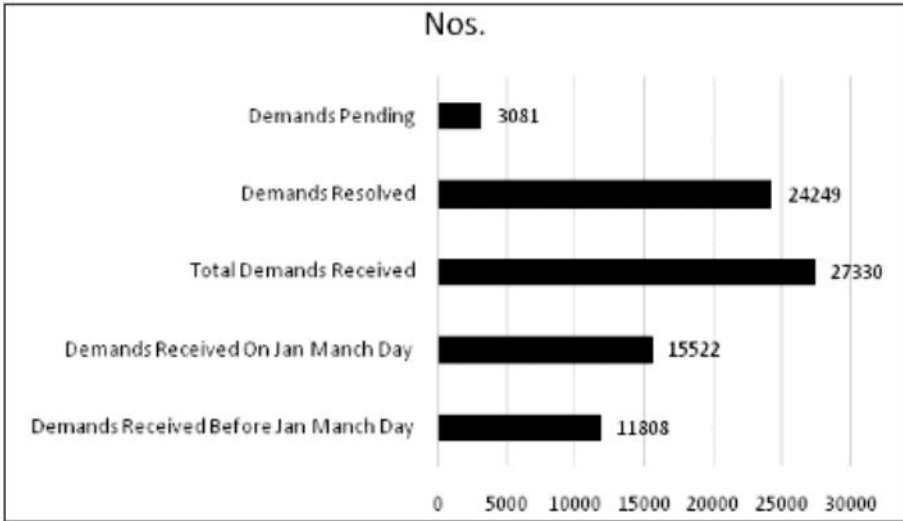
Source: *himpragati.nic.in*

It may be observed from the Figure 5 that the programme has remained instrumental to cater to 89% demands received in the State through *Janmanch*, a major share from the expectation for socio-economic development of their areas and lives. The rate of disposal of the demands of the people had been reasonably good since most of the demands put forth by the rural community related to social and economic development of the area. The demands raised indicate the expectations and faith of the people from the government of a State with the credit of being a good governed State.

Discussion:

The results of the *Janmanch* programme have been evaluated on the REESI+E framework in the relevant sections classified below:

1. Relevance: The initiative has evolved as a platform for the common people for public accountability of officials to get their basic grievances resolved. The *Janmanch* has been functioning as a means of Public hearing that can be viewed as a forum through which public expenditures on development works in a village are accessed, collated, and distributed among villagers to obtain peoples' testimonies about significant concerns about development problems or issues. The programme aligned the State priorities to provide them government at door steps. It has been designed for achieving the intended results as the developmental works in remote areas, human development initiatives and grievances have been taken up substantially. The programme

addressed various cross-sectional themes including accountability and transparency, gender mainstreaming and sustainability since all the elected public representatives and community members had a chance to raise their voice on public platform without any bias and get them redressed. The summary of the programme (Table 1) strengthens the fact. The IT-enabled tools for progress monitoring proved to be innovative demonstration of the initiative.

2. Efficiency: The Programme has been successful to cover 50% of the rural population of the State in a period of 16 cycles. The *Janmanch* initiative proved successful as presented in the *Janmanch* Summary (Table 1)which brought most of the District level officers to the remote areas on *Janmanch* day and to take remedial actions for solution of the problems the poor people residing in these areas. The civil works of smaller nature in the remote areas could hardly had caught the notice of officers and political leaders in contrast to the works of major nature in context of State importance. The fact is further supported with the status of grievances (Figure 4) which has proved to be highly remarkable. The trend of 100% achievement has been followed in case of issuance of certificates and saturation schemes. The available human resource in the district has been suitably rationalised for the effective implementation of the programme. It has emerged as a model of convergence of all the programmes aimed at socio-economic development as every programme got monitored at one platform in the district with effective coordination. The initiative has established faith among the public as a platform for them to resolve grievances resulting into social capital generation and social trust in the government.

3. Effectiveness: The programme performed in terms of achieving the expectations in disposal of the grievances which had been more than average 95% for all the concerned departments, a benchmark for achieving intended outputs and outcomes. Sufficient activities were undertaken for information, education and communication for environment building and awareness of the community with brochures and pamphlets prepared by departments with elaborate information. The programme has reduced the red tape in certificates, paper work and mutations as established from the factual data (Figure 2). Though the programme hardly had any commitment for fulfilling the demands raised by the people, yet the performance on meeting the demands had been highly remarkable. The bottleneck in the implementation of the programme had been social audit which had hardly been presented and discussed in *Janmanch*. The budgetary allocation for implementation of the programme has been fixed Rs. 2.00 lakh, but, the expenditure of Rs. 415.12 lakh has been incurred against the sanctioned amount of Rs. 258.96 lakh which also establishes that budgetary requirements for the programme are inadequate.

4. Sustainability: The public hearing in *Janmanch* not only supports the government position and policies besides giving an opportunity to get a first-hand experience of the impact of implementation of programmes and schemes. The programme had not been mere a flash in pan, but sustained continuously until the Covid-19 hampered all the gatherings. The public hearing in *Janmanch* not only supports the government position and policies besides giving an opportunity to get a first-hand experience of the impact of implementation of programmes and schemes. The social welfare in terms of toilets construction and welfare pensions facilitated as investments for the sustainability of programme (Figure 3). Cleanliness has been followed not only before the organisation of *Janmanch* but also after the accomplishment of the function which is really appreciable. The programme, cycle after cycle, had received overwhelming positive response in view of the resolution of the grievances at the door steps in an easy and hassle free manner. The outcomes of the programme are monitored through *Himpragati* website by the Chief Minister Office. The IT enabled solution, convergence with e-samadhan and *Mukhya Mantri Seva Sankalp Yojna* have put in place a mechanism with report card to review the performance of the programme. The sharing of platform for all the elected representatives of all the tiers irrespective of their political affiliation has brought a feeling of commitment towards the people.

5. Impact: The perceptible change is obvious in terms of executed works, certificates issued, mutations undertaken, health camps organised and citizens checked. Besides this, the benefits of different welfare and socio-economic development schemes could reach to the people. The high rate of grievances resolved emerged as a strong proof of positive impact of the programme. Social audit has remained an area of neglect as nothing on this account emerged in *Janmanch*. It has proved to be an instrumental step in this direction and emerged as a Social contract between government and people since the people have found a place to demand that social accountability. The inspection of 1528 civil works is a landmark for impact of the programme (Figure 2). The impact had been visible in terms of social, economic and environmental development and quality of life. The footfall in *Janmanch* has increased to get the justice delivered at home instead of running to district or State level offices. The public hearing in *Janmanch* not only supports the government position and policies besides giving an opportunity to get a first-hand experience of the impact of implementation of programmes and schemes. The public hearing in *Janmanch* not only supports the government position and policies besides giving an opportunity to get a first-hand experience of the impact of implementation of programmes and schemes.

6. Equity: As a part of the scheme design and implementation mechanism, the

targeted action mandated in order to reach out the most vulnerable groups in accessing the programme had been remarkable as the platform afforded space to all the sections of the society to get not only the grievances resolved, but, also their demands getting addressed in time. The programme afforded participation of elected members of all the levels irrespective of their political affiliation or power position. The organisation of health camps and health check-up of citizen (Figure 2) are the milestones for equity in the health sector in the remote areas. The equity is further supported with the data on financial inclusion (Figure 3). The local food based community lunch - *Dhaam* resulted into uniting people and joining them in the event. The contribution of the programme towards reduction in inequality of opportunity had been outstanding through saturation of schemes where benefits were delivered on the spot through the Minister including different welfare pensions.

Suggestions:

The time-bound action of the generic nature of problems coming up in *Janmanch* may be incorporated through changes in policies and schemes supported with the penal provisions.

Social audit brings transparency and accountability, Therefore, social audit of ongoing schemes must be ensured on priority in the *Janmanch*. The social audit reports of all the programmes undertaken in the coverage area may be presented in the *Janmanch*. The representative of State Social Audit Unit may also be included in the *Janmanch* Team as composed vide *Janmanch* Guidelines.

The social media and local cable TV may be used for publicity of *Janmanch*. A dedicated Mobile phone application may be developed for addressing the needs of all the stakeholders viz. Ministers, Govt. Departments, Observers, citizens and for follow up action. The follow up action on the issues taken up in the *Janmanch* may be categorised as proactive disclosure to presented in the *Gram Sabha* meeting of the concerned *Gram Panchayat* besides putting it up on the notice board in the concerned *Gram Panchayats*.

Conclusion

It is concluded that the problems/grievances addressed in *Janmanch* are solved with satisfactory measures. The implementation of *Janmanch* has helped to improve the accessibility of the government by addressing grievances and demands at the door step of the community which reduces foot falls in government offices. It is the responsibility of government to spread education in this regard, so that people can come to attend the *Janmanch* and get their grievance redressed. The success of *Janmanch* depends on continuation to provide proper platform for effectively redressing the problems/grievances of the people.

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Economic factors in the decision-makingabilities of civil servants: A Behavioral Economic study

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Abstract

Civil Service, the fulcrum of decentralised governance plays an important role in the overall design, conception, and implementation of public policies such as enabling basic municipal services, strengthening social sectors such as education, health, coordinating law and order agencies, mitigating disasters, facilitating rural and urban development, etc. (World Development Report 2004: Making Services Work for Poor People)through leadership qualities which includes effective decision making. If compelled to manage with limited resources, it can create "load" on cognitive function (Mullainathan and Shafir, 2013). In addition, lack of economic wellness can cause stress and depression (Haushofer and Fehr, 2014).

The organisational structure of Civil Service, unlike in the private sector, is varied and is a mixture of different domains in terms of hierarchy, level of autonomy, style of communication, etc. There are some organisations with strict rule-bound administration like line departments and some are autonomous to take their decisions. The delegation of financial and administrative powers is not uniform across Civil Service organisations and this could be one factor for preference of autonomous bodies by civil servants as found in this study.

The enriched climate and its impact on the work effectiveness are generally studied in organisational climate of private organisations, whereas such studies are minimal in public organisation. Hence, an organised study was undertaken in this explorative-cum-evaluation analysis to understand the influence of two important factors such as the performance grading and perception of financial delegation power on the cognitive functioning of civil servants. This attempt is also an extension analysis of the Institutional approach of public policy which focuses primarily on structured patterns than the linkages between the office structure and policy decision making.

Why study the cognitive function of civil servant?

"The better understanding of Psycho-Socio-Cultural understanding of the human decision making and human behaviour can have a significant impact on developmental outcomes." (The World Development Report 2015).

The need for State has been emphasised in Social Contract Theory of John Locke, Jean Rousseau, and Thomas Hobbes, which describes that people surrender some of their entitled rights and freedom in lieu for getting or maintaining the social order. Hobbes (1651) in his book titled Leviathan stated that "human life would be nasty, brutish and small without political authority. In the absence of which, there will be unlimited natural freedom, right to do all things, right to harm, all who threaten our self-presentation and there will be a war of all against all".

State traditionally renders allocation or production of goods and services, distribution and stabilisation) and growth, whereas concepts like co-ordination, facilitation, minimal regulation, conflict resolutions have emerged later. The latter concepts place the citizen in an empowered position and also have led the citizens to monitor the performance of Civil Service through various means of citizen-centric legislation. Hence, the Civil Service must play a balancing act between the State and their decision-making powers as these still paternalise the socially desired citizen-behavior which still holds good. (Amir, O et al 2005). This balancing act requires better decision-making skills to civil servants.

Factors facilitating decision making

Public policymaking involves strong decision making affected by various factors. Frederick Herzberg summarised those factors into two categories, namely, hygiene and motivating. Of them, economic independence (the work itself factor) and organisational autonomy (work condition factor) have been examined in this study.

Economic factors:

Homogenous rationality assumes that human beings irrespective of their differential skills/endowments are equally rational in making better choices. Various research proves that cognition of human beings is affected by a number of factors, including economic. One such finding which was published by World Bank in its report titled Mind, Society, and Behavior in 2015, says that "poverty is traditionally thought of caused by the absence of monetary wealth, but it is vicious cycle between economic decisions among choices and the resultant mental tax." This mental tax influence economic decisions and cause perpetuation of poverty by three means:

- Poverty makes the individual concentrate on present demand at the cost of future requirement;
- It generates poor framework of information/choice; and
- The nurture or the environments in which the poor live, also make additional cognitive demands and thereby further taxations.

From the above, it is inferred that the economic wellness of a person generates impacts in cognitive process of human beings.

Autonomy- its relevance on decision making process:

Absence or more supervision is one of the dissatisfaction factors in the Civil Service (Civil Service Survey, 2010, GoI). Autonomy of organisation in which the employee is delegated the powers and responsibilities holds the key in facilitating effective decision making. Work autonomy has three important aspects, namely, work method(to design the procedure and path), work schedule (to decide on the time factors for selection of the task, completion period) and work criteria autonomy (to determine the standard to evaluate the results, progress and to undertake course corrective measures (Breaugh 1985; Hackman & Lawler, 1971). Of the four different types of government organisations, more functional autonomy in terms of funds, functionaries and powers is reported to be in non-departmental types such as boards, companies, corporations etc.

Tools used in the study:

Three standard tools have been utilised in the study. The decision-making construct was measured in this study by using the Melbourne Decision Making Questionnaire (MDMQ) developed by Mann, L., Radford, M & Ford, and S. (1997) which has 22 items. It measures the four different approaches of decision making, namely, vigilance, hyper-vigilance, buck passing and procrastination. Vigilance involves a careful decision making, weighing possible alternatives, and hyper-vigilance is a style having anxious and hurried decision making. Procrastination involves the delay in decision making, while buck passing is a character of leaving the decision to others and shirking the responsibility.

Work autonomy scale authored by James A.Breaugh (1985), was utilisedto measure another study construct which has to identify work method, work schedule and work criteria. The responses were measured in five-point Likert scaling method. Similarly, for economic wellness, the tool was designed after focused group discussion and survey and has five items to measure the responses in five-point Likert scaling method starting from 1 (Strongly disagree) to 5 (Strongly disagree).

Pilot Study

A pilot study was conducted upon 50 participants to check the feasibility of the tools. The reliability measures of all the measures got in the pilot study are presented in below mentioned Table. The reliability measures of the five variables under this study are lying in the ranges from ranges from 0.63 to 0.85. The mean value of the variables under study has a range from 2.88 to 4.22.

Sl. No	Measures	M	Mean	SD	Cronbach α
1	Decision Making	Vigilant Decision Making	4.22	.43	.70
		Hyper Vigilant Decision Making	3.36	.63	.79
		Procrastination	3.26	.63	.79
		Buck passing	3.00	.60	.63
2	Economic Wellness		2.88	.29	.85

Table 4.1: Mean, Standard Deviation and Reliability measures from the pilot study

Procedure followed in the study:

Armed with the results of pilot study, the actual research was then carried out with the sample population of civil servants who were randomly selected based on proportionate sampling method of population. The sample covered both the departmental undertakings and autonomous institutions in all the four regions of Puducherry. 510 questionnaires were distributed, and of these 260 questionnaires received and after verification 200 completed questionnaires were used for this study.

Structural model for economic wellness and decision making:
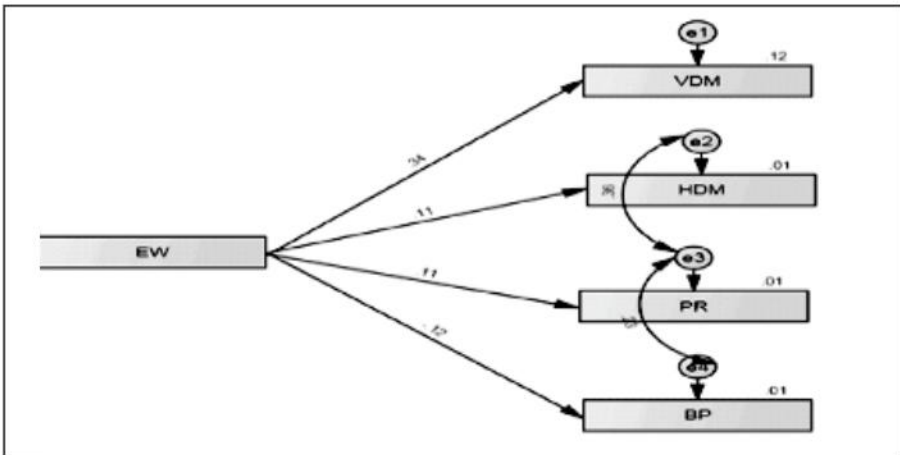
Table 1: Standard is edregression coefficient, standard error and co-variance estimates of the direct path between the exogenous and endogenous variables

Path	B	S. E	CR
EW → VDM	.342	.052	5.127
EW → HDM	.110	.081	1.567
EW → PR	.108	.079	1.527
EW → BP	-.116	.077	-1.649

Table 2: Goodness of fit measures

| Goodness of Fit Measures	χ^2	Df	χ^2/df	GFI	AGFI	CFI	NFI	PGFI	RMR	RMSE A
	12.39	4	3.10	.97	.91	.89	.86	.26	.02	.07

The modeling shows a significant positive relationship from the economic wellness to vigilant decision making dimension of decision making variable(β=.34) compared to other dimensions such as hyper vigilant decision making (β=.11), procrastination (β=.10) and buck passing (β=-.11).

Structural model for workplace autonomy and decision making:

This model analyses the interrelationship between the workplace autonomy and decision making of the civil servants. The research findings are tabulated below.

Table 3: Standardised regression coefficient, standard error and co - variance estimates of the direct path between the exogenous and endogenous variables

Path	B	S. E	CR
WMA→VDM	-.129	.032	-1.991
WMA→HDM	.072	.056	.893
WMA→PR	-.071	.057	-.858
WMA→BP	-.090	.052	-1.150
WSA→VDM	-.151	.037	-2.393
WSA→HDM	.017	.061	.232
WCA→VDM	.511	.061	8.351
WCA→HDM	-.019	.106	-.253
WCA→PR	.063	.115	.761
WCA→BP	.102	.104	1.303
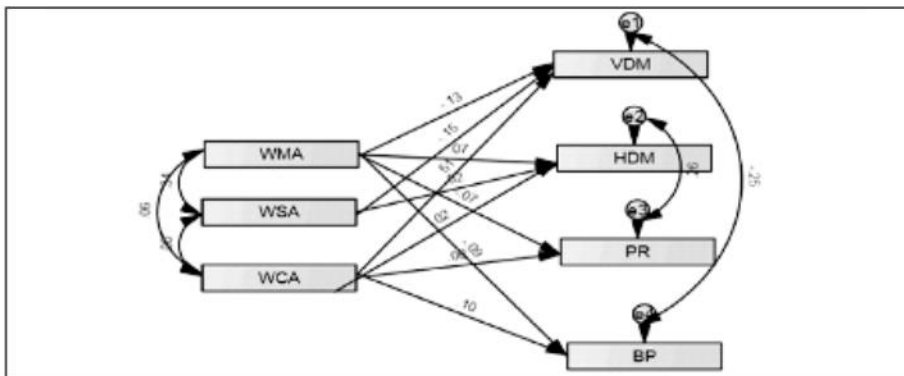
Figure 1: Structural model for work autonomy and decision making

The model exhibits significant positive relationship between the work criterion autonomy (the related administrative concept of performance grading) and vigilant decision making (β=-.511). The model showed that there is a negative relationship between the work method and schedule dimensions of work autonomy to vigilant decision making (β=-.129, -.15). While there is positive path between it to procrastination (β=.063) from work criterion autonomy the path to buck passing is negative (β=.-.102).

Table 4: Goodness of fit measures

Goodness of Fit Measures	χ^2	Df	χ^2/df	GFI	AGFI	CFI	NFI	PGFI	RMR	RMSEA
	26.289	6	4.381	.96	.82	.81	.79	.21	.04	.08

Major findings:-

- **Economic wellness positively relates and significantly predicts with vigilant decision making**

Whether Improved Economic state leads to better decision making? Various research justify this postulate. In an experiment done on the sugarcane farmers it was found that the farmers who generally are not well off before harvest (the percentile of holding loan before harvest was estimated 99 against 13 after harvest and the percentile of those who pawned some of their resources before harvest, was 78 as against four after harvest), performed better in the tasks of mental tests that were designed for executive function and fluid intelligence) and the difference in the scores were found translated to approximately ten IQ points which are not generally attributed to other reasons, but, economic wellness, after harvest which enabled the farmers to perform better as their cognitive resources are efficiently deployed.

The report found out that the economically well-off farmers were able to take better decisions of their livelihood, and children's education. Cross cultural similarity: The report argued further that such poor decision making due to being not well off are found across the culture and the similar findings were reported among the farmers in United States (Mani and others, 2003). Though the poverty line is different due to the economic development ($13 in US against $2 in low income nations) the result of field experiments conducted among the US farmers on such similar mental tests was found to equivalent difference of 13 IQ points. The diminished executive functions are reportedly related to scarcity in economic resources (Shah, Mullainathan & Shafir, 2012).

The close observation of these studies reveals that there exists a relationship between economic well-being and mental health activities. The economic balance helps the individual to have focused decision making on the life

requirements. This economic wellness makes the conservation of psychological energy, and, thus, prevents cognitive taxation. Thus, brain drain is prevented which helps the individual to focus more effectively on life demands. This in turn, causes the individual to augment the economic wealth and results in the following vicious process.

This and other kind of similar conceptual studies in the field of behavioral economics have given results that there is positive relationship between economic factors and thinking ability which is an essential requirement for the functioning of civil servants.

Perceived economic wellness, which was measured through the perception of civil servants towards their economic affluence in both the official and personal capacities, is found closely related with the vigilant decision making than other three dimensions such as hyper vigilant, procrastination and buck passing clearly bring out close relations between the economic conditions and cognitive potential. Thus, they support behavioural economics concepts which say that economic adverse conditions causes cognitive taxation and thereby impedes decision making. Economic wellness either in the form of pay or delegated financial powers has been proved by various studies as positive effect on work performance and able-decision making. As propounded by British organisational psychologist Peter B. Warr in his famous Vitamin theory, money and economic power does not have limitation and does not yield negative effects on motivated performance and decision making. Hence economic wellness to the civil servant in the form of enhanced financial delegation or the remuneration makes their functioning more motivated.

- **Work autonomy positively relates and significantly predicts the vigilant decision making**

Work autonomy is also found in this study as being closely related with the motivated functioning. Job enrichment makes the work force happier and creates better results. Grant of freedom in work, or in other words, work autonomy facilitates the civil servants to better decisions. Functional freedom enables effective usage of cognition and stress-free mind which favours

vigilant decision making- arriving at decisions based on maximum cost-benefit conundrum. The freedom to frame the performance of future tasks and then rated by the actual performance (an essence of annual performance appraisal report) is found as the most relating dimension of work autonomy for vigilant decision making of civil servants.

The study has brought out the importance of performance appraisal system and its influence on the decision-making style of the civil servants as work criterion autonomy is positively related with the better form of decision making (vigilant). One of the major and frequent reforms of Civil Service is performance appraisal management which is taken into consideration for assigning higher level positions involving vital decisions with high stakes. Intense relations between the work criterion autonomy and objective decision making reflects the similarity of importance given by the governments and civil servants on the work criterion which goes well with the findings of the commissions such as pay commission and Administrative Reforms Commissions. Besides committees, which devote much concentration on performance appraisal to promote positive organisational climate in the Civil Service. However, it should be also kept in mind, that autonomy should not be unlimited and needs a control (Peter B. Warr, 1987) for guarded decision, as it involves lives and matters of billions of people in one stroke.

Will these two factors be continued to play all through the career?

While the above study emphasises the importance of economic wellness and criterion autonomy for more expression of vigilant decision making by civil servants, the same twins are not found together in later parts of the carrier. To identify whether there is a long-lasting relationship between these factors and career trajectory, focused group discussions were held with the respondents civil servants. The results were then indexed in to two, namely *availability (posts) and desirability (willingness to work)* which are graphed below.
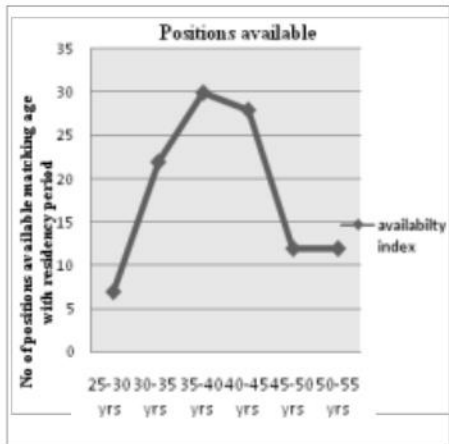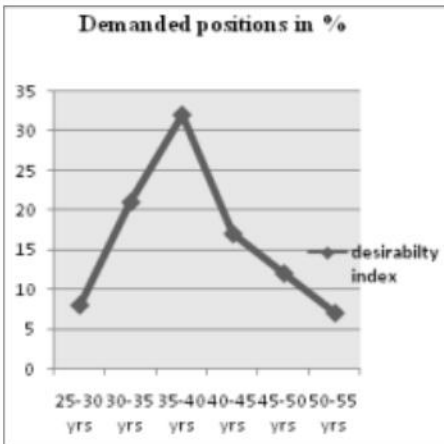
Focused group discussions were held with civil servant participants to understand the preference pattern of them for the organisation they would like to work under in their entire career trajectory. It was found that the preference of regular departments is more in the initial part of the career. This is due to work profile which makes that early recruits are placed in rigorous organisational set-up and are not endowed with essential experiences to occupy autonomous bodies.

On the other side, important factors for the sway to autonomous types of offices in the middle of career is attributed to the availability of posts matching the eligibility, personal reasons, job enrichment offered in the autonomous type of institutions etc. Of them, job enrichment in other words, the variety nature of job and the opportunity to express their talent by effectively utilising the experience gained (cognitive capacity) in the earlier stints in regular departments were cited as most important causes for preferring autonomous types of institutions by many participant civil servants.

Similarly, the preference for departmental types at the later parts of the career was attributed to the smaller number of available of posts in the autonomous bodies and the willingness to utilise the experience gained in the autonomous types in the regular departments.

This result implies that among two factors i.e., economic power and performance autonomy in terms of annual work plan, grading etc. the former plays consistent role as an important influencer towards preference of the organisational type and to take decisions as a civil servant. The autonomous bodies - structural aspects of organisation, are no longer found influencing the organisation to work in later careers, but, the economic power available in the form of delegation of higher financial power in the departmental undertaking overrides the preference towards the autonomous institutions which were once after sought a lot. In other words, behavior is always getting influenced by economic factors-**the core theory of behavioral economics** than any other factor.

Conclusion

In essence, the study has clearly established importance of both economic conditions and structural aspects of organisations in the cognitive abilities and behavioral pattern of civil servants. If the civil servant, like any other individual, is compelled to manage with limited resources (Mullainathan and Shafir, 2013) and constrained autonomy, it can create "load" on cognitive function as less or lack of these vitamins can cause stress and depression (Haushofer and Fehr, 2014; Peter B. Warr, 1987) which can impede their effective functioning. Hence, the systems need to be designed with more results and less cognitive load for its effectiveness (Hu et al, 2017).Civil Service

mostly involves taking decisions in uncertain circumstances. In such scenario, as per the postulates of prospect (value) theory, the utility assigned by the individual for values are different (Anderson, J.R. (1985), and losses are placed heavily on the utility continuum than the gains of equivalent value (Richard H. Thaler 2016) due to the psychology of human beings. Hence, economic independence will help as a supporting factor to enable better decision making by civil servants.

The traditional type of government is slowly waning, and people expect new public management (Perry, J. L. 2021). The new public management is characterised with result driven and decentralised set-up whereby the societal interest is paramount. Bureaucracy must be impersonal (Lakshman C, 2003), and should strive for balanced decision making for optimum results and be a happy work force. While both the transactional (monetary) and other relational factors are essential to sustain the motivation of civil servants (XLRI, 2008), economic factors overweigh than other factors in facilitating better decision making by the civil servants.

Implications of study:

The emerging field of behavioral economics analyses this relation in both the controlled and natural environments, and offer many useful information and ideas to the policy makers. Many countries like United Kingdom and United States of America have made permanent institutions in their policy making structure to examine this inter relationship to paternalise the behavior of their citizens without affecting freedom of their choice. Similarly, institutional models of public policy have focused on only the structural aspects rather than processes which involve human behaviour and their cognitive processes. This research results have added that dimension of human behaviour in the policy structure studies and will be helpful for better and healthy civil servants. This study also facilitates similar such research to understand various influencing factors of human cognition.

Limitations:

The findings of this research have high relevance in the Civil Service. The positive association between economic wellness and decision making, which is confirmed in this study, can be further examined for effective Civil Service. However, this study is also not free from limitations. The research was aiming to identify the linkages between the economic factor with cognitive efficacy. But, the economic affluence is measured as a perceived construct, hence, it may vary from individual to individual. The study was limited to the sample population of civil servants of a region, and hence, generalisation of findings needs caution. The study focused on limited antecedent variables and attempted the analyses of limited consequences. Hence, similar systematic

enquiries and research needs to be conducted in the field of Behavioural economics discipline to have more insights in to the civil servant behaviour.

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Good Governance:
Door step delivery of services

Vinod K. Advani

India is a vast country with far flung villages. Porbandar is a district with the second-lowest population in the State of Gujarat. The district had a population of around 6.5 lakhs in 2022. A mainly a grarian district, with low penetration of industry, it has started its journey towards rapid development. People staying in those villages need services from Government in the form of ration card, income certificate, caste certificate and authorised documents for educational and vocational purposes, and for availing benefits of various welfare schemes and developmental schemes of the Government.

Most of the times they have to travel to a Government office for the purpose more than once. In Gujarat, under the digital *Seva-Setu* program, a total of 56 services have been made on-line. Applications are submitted on Digital Gujarat portal through data entry being done by the Village Computer Entrepreneur (VCE). Then, through process re-engineering and as per the task-based work flow, necessary validations and on-line approvals, print is taken in e-gram centre and signed by authorised *Talati* and given to the applicant.

In a path-breaking initiative, mobile digital *Seva Setu* has been started in Porbandar since 6 months now. A laptop, a printer, UPS, battery back-uphave been set-up in a vehicle. A VCE of *Gram Panchayat* and a *Talati* work from the vehicle. Other aspects of work-flow remain the same. This move is helping citizens avail Government services independent of place. This reduces the number of trips to the *Taluka* Development Officer/Mamlatdar office/e-gram centres besides reducing travel time, considering the topography of the district. Mobility mitigates the internet connectivity issues also.

This model is being used for issuing PMJAY-MA card and e-shram cards also. It is very cost effective, and can be started within Rs 50K. It is also a scalable and imitative. This system can help people pay electricity bills, phone bills, taxes, etc. besides other services.

Glimpses
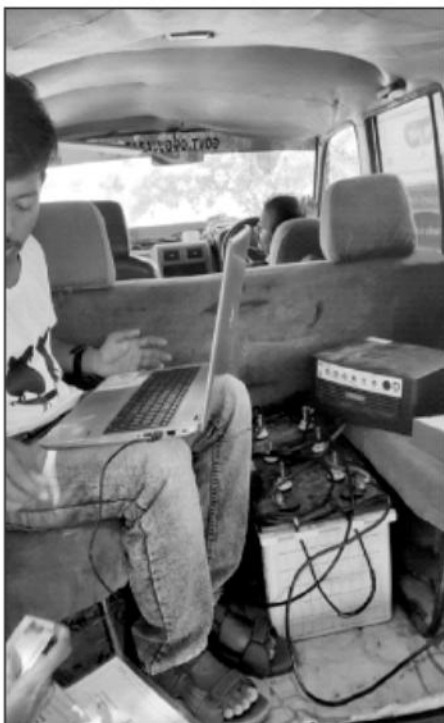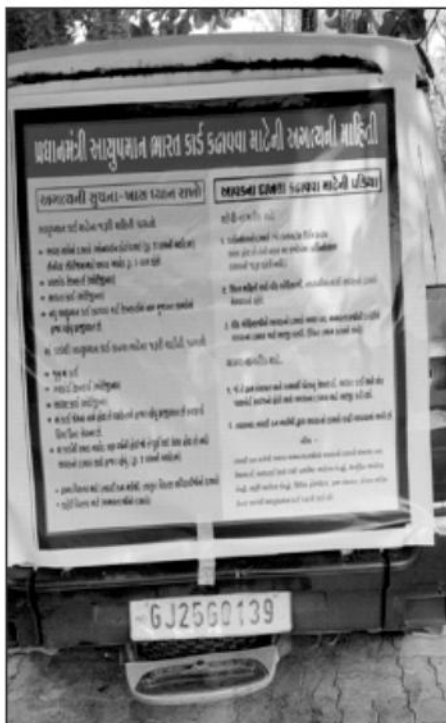
Shri Vinod K. Advani

The author is an IAS officer of the Gujarat cadre, 2014 batch and this article is based on his experience as the District Development Officer of Porbandar.

Network Governance & Creative Leadership: The Formation of Udupi Jille*.

Dr. Kalpana Gopalan

Abstract

The creation of a new district throws up unique experiences and unusual challenges. In this first-person narrative, the author recounts her role as the first District Collector of Udupi District in Karnataka, India. On the occasion of the Silver Jubilee of the district, she draws upon her personal experience to paint a readable, worm's eye view picture of the establishment of Udupi district. It is believed that for scholars of public policy, this is a useful case study set against the backdrop of a transitional, developing economy context.

Article

A career in the Indian Administrative Service throws up many opportunities for Leadership. Yet, for me, the unique, once-in-a-lifetime experience was the role I played in the establishment of the new district of Udupi. The temple town which is home to the famous Lord Krishna temple.

In 1997, the Government of Karnataka took a policy decision to bifurcate certain large districts to create seven new districts for administrative efficiency and convenience. Udupi was one of the new districts. The posting happened innocuously, with the Chief Secretary calling for me and informing me, in his usual understated style, that I had been posted as District Collector (called Deputy Commissioner in Karnataka), and could I please leave as quickly as possible? "The MLA's are getting quite restless, you know. They feel the government is not serious about launching the new districts. Your going there will reassure them."

I landed in Udupi the next afternoon to a warm welcome. I was an acceptable choice as a lady officer, for the region shared the matriarchal influence of Kerala. It was my first posting as a Deputy Commissioner, and I was also Udupi's first Deputy Commissioner. I was anxious to prove myself. Expectations were high, but infrastructure, funds, staff all were wanting.

Normally, District Collectors are inheritors of a hoary tradition dating back to British rule, and the accompanying paraphernalia of pomp and creature comforts. However, a new district is different. The local officers could not

immediately shake off the mindset that they belonged to the 'parent' district Mangalore. Moreover, the administration and finances were still with the District Collector, Mangalore.

I decided then and there that my first task would be to create an identity for my district. In government, one is running in different directions at the same time! But I had a good idea as to what I wanted, and proceeded as systematically as circumstances allowed.

Figure 1

I wanted to try and take the citizenry along with me, as Udupi had a literate and aware populace. Together we launched the process of district building. My first priority was to locate suitable accommodation for government offices. An action plan was chalked out for the development of the district without disturbing the rich ecology of the district. Industrialisation in the Western Ghats area is fraught with tension, owing to the presence of activist NGO groups. So, from the beginning, Non-Governmental Organisations were inducted, and the agenda drawn for the district attempted to be in tune with its educational, pilgrimage and tourist potential.

The beautification of Udupi town was another initiative I took up. Udupi had a then little-known but lovely beach called Malpe. We started the campaign with a March for a Clean Malpe by school children. This was followed by a Shramdaan for garbage clearance. Certain prominent businessmen contributed to the erection of boards, dustbins and lighting. More difficult was the relocation of the fisherman's families along the coast. This was achieved by distributing alternative free sites slightly away from the main beach area.

Figure 2

I touched base with my superiors regularly, especially with the Secretary to Government in the Revenue Department and the Divisional Commissioner who became valuable and appreciative allies. Simultaneously, I began work on the process of carving out the new district in close coordination with my counterpart in Mangalore. This was a Herculean task, complicated by the feeling of being 'divested of authority' which he felt. However, we got over it, and I had a staff, vehicles, funds, and a 'treasure' of 2000 files in record time. Since prior willingness of the officials and officers was taken to post them in the new district, they were willing to work hard.

So busy was I with my work, I had so far not paid much attention to the local politicians, except preliminary courtesies. My Assistant Commissioner, a seasoned and diplomatic officer, sensed that they were feeling left out. All my self-congratulations vanished when a local newspaper blamed the new lady Deputy Commissioner (who had spent hardly a few months in the district) for the district's poverty and other longstanding ills!

Figure 3

The demands were many, and I was facing a severe resource crunch. However, I found myself touring all over this supremely beautiful district, which I felt, was my own. I became competitive and battled with department after department for a share to my district. My district had to be the best, and soon the District Minister and others were happy. In fact, the District Minister became my strongest ally whenever I needed to skirmish with the State government for Udupi's needs. Still, political support could become embarrassing, and when an opposition MLA openly criticised the government for not supporting and "helping out" the Deputy Commissioner, the Chief Minister was quite irritated with me! But it worked out, and soon Udupi was the only new district to have an office, staff, and a functional district administration.

Figure 4

Flash forward twenty-five years. On 25 August 2022, Udupi district celebrated her Silver Jubilee. On that occasion, I was invited to participate in the celebrations, and was felicitated by His Excellency the Governor of Karnataka on the dais, before the polity and bureaucracy, and most importantly, the citizenry of Udupi. Only those who have an experience of public service will realise how rare an honour it is that an officer is remembered for her service after 25 years! I thanked the present District Collector, my junior colleague, for remembering me. His reply was: "Madam, I did nothing. The demand for your presence and recognition came spontaneously from the people of Udupi!" What a heart-warming moment it was!

In hindsight, I think I did well in places and badly in others. My enthusiasm and commitment I would repeat, and it was my good luck that Udupi had an aware populace, which recognised my efforts. Today, I would recognise that a

team of non-officials and citizenry has greater potential to support me. I hesitated to relocate my Assistant Commissioner (whose sub-divisional headquarters was the neighbouring town of Kundapur) because I did not want to make too many administrative changes at one go; but, thereby, I failed to benefit on a daily basis from his experience. I got too involved, the district became my 'baby' and sometimes I was bogged down in trivialities. Though there was no serious negative fallout I would probably be more objective today. I was uncomfortable with the discomfiture of my counterpart in Mangalore; but my way of coping with it was to ignore personalities and concentrate only on the task. If I had, on the other hand, shown sympathy non-verbally at least, he could have helped me much more because of his greater resources. On the other hand, it is also heart-warming that some of the initiatives I took up have sustained until today. The Clean Malpe campaign I began, was continued by the Udupi Municipal Council, and Malpe is a popular tourist destination today. I was happy to sanction a mechanical beach cleaner to Malpe many years later under the challenge fund.

Figure 5

I inaugurated a restored heritage house in Udupi in 1997; today heritage restoration and heritage tourism is a thriving activity in which initiatives like Hasta Shilpa Trust are engaged on a continuing basis.

Figure 6

Today, as I look back 25 years, I want to share with you why Udupi is so important to me, both professionally and personally. After all, as an IAS officer, I have worked in many locations, experienced unique opportunities, and met so many interesting people. However, despite these diverse experience that so many IAS officers have, you will not even come across a handful who have had the opportunity to actually set up, to create, a new district. Today, we are very familiar with start-up culture: Swiggy, Zomato, etc. Udupi was our very own start-up experiment in the public sector, something that the then government went ahead bravely and created. I remember one senior officer telling me as he sent me off, "Kalpana, wherever you stand, that is the district!" It was treading into the unknown, and I just went and did it. That is what we were in those days brave in our innocence and our faith.

That brings me to the second reason why Udupi is so special, not only among the new districts, but among all districts. The start-up of 1997 is today, a unicorn of 2022. Just walk or drive on the roads of Udupi, it has the look, feel and spirit of an international city. Whether as an education hub, a health sector nerve centre, or a tourist destination, Udupi has tremendous potential and has outstripped not just the new districts, but also many of the older district headquarters. This in 25 years, and there is so much more to come!

What is the reason for this? The primary reason is the constructive, creative, peaceful and law-abiding nature of the people of Udupi. I remember that when I was Deputy Commissioner, there was a strike notice by private transporters of *Dakshina* Kannada and Udupi. Along with the police and the transport department, I called for a meeting immediately and came to an understanding that there would be no untoward disruption. And they kept their word. Even though the strike took a serious turn in Mangalore, Udupi remained quiet and life went on as usual. In fact, our colleagues in *Dakshina* Kannada were quite irritated with us, but this was to the credit of Udupi's ecosystem, not just government or us.

The people of Udupi are also very critical and questioning. In this context, I recall the late Shri. V.S.Acharya, who contributed so much to this district. Mr.Acharya's nature was, like so many of Udupi's people, that he would never accept anything just like that. He would ask questions about everything until he was satisfied. One day, Shri Acharya came with his followers and colleagues to my office. I had ordered new furniture for the DCs office, and it had been delivered. My staff had neatly cleaned and arranged it so well, the furniture was very good quality, looked very nice, Mr.Acharya could not find anything to question. Nonetheless, he had to, so he asked me, "DC Avare, neevuyaake blue colour furniture tagondideere?" ("DC Madam, why have you purchased blue upholstered furniture?"). The furniture was upholstered in blue, so he asked me why I had chosen blue upholstered furniture! Fortunately, I had some presence of mind, so I told him "Sir, blue Udupi

Krishnana colour allava, Neela Megha Shyamalanallava Sir, adakkeneela colour tagondideene Sir". (Sir, isn't blue the colour of Udupi Krishna? After all, isn't he known to be as dark as the dark rain-cloud? That is why I have bought blue furniture).Acharya Sir, being personally and politically a devout Hindu, was satisfied!

I gained valuable lessons in Udupi, and it has a permanent place in my heart. Today, I take pride in the smooth functioning of the district administration, and glow when I am recognised when I travel in Udupi, even after a gap of almost two decades. I would like to close this walk down memory lane with one final anecdote of Udupiya Shreshta the (Udupi's fame), which highlights another quality of the people of Udupi. However, questioning and critical they may be, they recognise and acknowledge honesty and hard work. In my last visit, an advocate approached and introduced himself. He had been practising in my court–Deputy Commissioner's court. These are his words: "Madam", he said, "When Udupi was formed, so were several other new districts. Udupieshtubeledidenodi, eshtupragatiyaagide. But Udupi has developed into such a vibrant city, it has outstripped not only all the other new districts, but so many older district headquarters … Do you know why? Yaakandare, neevuolleyamanasininda ii Jillegeadipaayahaakidiri. It is because you laid its foundation with a good, honest heart!".

Figure 7

I, along with all of you, look forward to the golden jubilee of Udupi Jille, when it will take its rightful place on the map of the world.

*Note: Jille is Kannada for District.

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Artificial Intelligence Use Cases in Smart Cities

Dr. Richa Rashmi

Abstract

The world is urbanising at an unprecedented rate. As the number and size of cities continue to grow, it has also led to new challenges such as pollution, environmental degradation, congestion, and widening disparity in accessing opportunities and adequate living environments. Seen from this perspective, technology will play a substantial role in tackling some of the crucial challenges of urban development. Technology has revolutionised the conception of cities and has given birth to the idea of smart cities. The paper explores how technology is changing cities and how cities are changing technology. Mainly, it focuses on how smart cities contribute to the collective effort towards enhanced global sustainability using Artificial Intelligence (AI). Focusing on the green and smart vision of development, this paper explores how smart city development and innovation can improve the quality of life, facilitate collaborative and open urban governance, and use data and technology to promote environmental resilience. The paper contextualises AI applications in smart cities through global case studies.

Introduction

Since the advent of civilisation, cities have been considered the engines of economic growth, technological innovation devices, social development systems, and grounds for pioneering ideas that changed the world. The world is urbanising at an unprecedented rate, with three-quarters of the population predicted to be city-dwellers by 2050 (The World Bank, 2020). As the number and size of cities continue to grow, it has also led to new challenges such as pollution, environmental degradation, congestion, and widening disparity in accessing opportunities and adequate living environs (OECD, 2013).With the world gearing to achieve the common goal of sustainable development, cities must contribute to enhancing global sustainability. In this perspective, technology will play a substantial role in tackling some of the crucial challenges of urban development.

Through most of human history, technology moved at a glacial pace. Intergenerationally, agriculture progression was tremendously slow. When

technological change did occur, it tended to be in cities where incremental improvements in urban tasks like weaving would occasionally emerge. However, in the late 18th century, things started to change. First, machines revolutionised cloth manufacturing, and then James Watts' separate condenser steam engines brought power to factories, cities, and transportation. The trickle of innovation then became a torrent. Cars, radios, air conditioners, and television sets radically changed how people lived while empowering, enabling, and changing how cities thrived. It is difficult to imagine Sunbelt metropoles like Atlanta or Los Angeles without the air conditioner.

Technology has revolutionised the conception of cities and has given birth to the idea of smart cities. World Bank says, "Smart cities refer to an approach to making the best use of data, technologies, and available resources to improve city planning, management, and service delivery" to engage citizens and enhance accountability (The World Bank, 2020). Rooted in sustainable and equitable development, smart cities use advanced technologies such as Artificial Intelligence (AI), the Internet of Things, Blockchain, Big Data Analytics, and Digital Twins to intellectualise city ekistics. This demands that cities be empowered through cutting-edge technologies and aligned and integrated well with the current institutional framework for urban planning and management.

While digital transformation remains the prime driver of the smart city concept, it is pertinent to ponder how these emerging technologies can be leveraged to improve the residents' quality of life. The second big question is how future technological change will impact cities. With the cityscape slated to change by the advent of autonomous vehicles, urban governance questioned through Twitter, and gig economies like Uber and Airbnb becoming the new mainstays, it is essential to understand the incremental benefits or detriments of investing in new technologies. Example, self-driving vehicles may ease time and travel requirements, but, exacerbate old city woes of traffic, accidents, and job loss for many in the transport business. Still, the potential advantages of deploying technology with well-balanced policies and laws can help improve the delivery of city services. It is, therefore, essential to ask how cities will balance the benefits and costs of change to get the most out of new technology.

In this context, the paper explores how technology is changing cities and how cities are changing technology. It focuses on how smart cities can contribute to the collective effort towards enhanced global sustainability using artificial intelligence. Gravitating on the green and smart vision of development, the paper explores how smart city development and innovation can improve the quality of life, facilitate collaborative and open urban governance to improve

transparency and ease of doing business and use data and technology to foster environmental resilience. It contextualises AI applications in smart cities through global case studies.

Literature Review

The literature for this paper has been reviewed to answer three central research questions across the three pillars of sustainable development – economic, social, and environmental - as explained in Table 0.1. The section studies various AI applications through use cases and is, accordingly, structured to classify their larger vision and purpose in urban development comprehensively.

Table 0.1: Research Questions

Research Questions	Sustainability Pillar
What AI applications are being augmented to facilitate ease of doing business and investment in local economy?	Economic Sustainability
How is AI being used to enhance quality of life for residents?	Social Sustainability
How is AI being applied to improve environmental resilience?	Environmental Sustainability

Source: Author's Compilation

Technological innovations have improved public service delivery and made it more accountable to public scrutiny. By capturing data, cities have been trying to integrate efficiency into urban systems successfully. The following section examines the application of AI in various city sectors and how they help augment the quality of life by providing improved and time-bound service delivery.

- **Energy**

AI is being deployed to accelerate the transition to renewables and reduce overall wastage of energy, making it cost-effective and sustainable in the long run (EY, 2020). Through smart grid, AI is also helping improve the overall control, operation, and planning of power systems by assessing 'grid stability and security, load forecasting and fault detection' (Omitaomu & Niu, 2021). Connecting smart grids to home devices can also facilitate efficient management of energy consumption through supply and demand modelling (OECD, 2019). Streetlights have been integrated with AI to improve safety and promote energy and cost savings. In partnership with General Electric, San Diego installed about 3600 sensor-equipped LED lights and intelligent nodes to collect and examine data on congestion, pollution, and overall atmospheric

condition, leading to an annual saving of approximately $2.5 million in electricity and maintenance (GE, 2017).

- **Mobility**

Chronically congested roads are a city's most significant mobility problem, experienced daily by commuters. The annual congestion cost is as high as $9.5 billion in New York City, with an average American losing $1859 (INRIX, 2018). The German Federal Ministry of Transport and Digital Infrastructure is funding the development of an intelligent, predictive traffic light that uses cameras and radar sensors equipped with self-learning AI algorithms "to ensure better traffic flow and shorter waiting times while providing improved safety for pedestrians at crossings" (Fraunhofer-Gesellschaft, 2022). Researchers are also experimenting with intelligent routing optimisation that enhances individual trip planning experience and helps calibrate the on-road traffic (Domenico, Lima, & Gonza, 2015).

Retail giants like Amazon and Alibaba are experimenting with autonomous cars (AI for Good, 2022). Self-driving vehicles are often fitted with numerous sensors and cameras to generate a generous amount of data for further processing by intelligent agents to make 'meaningful decisions' (Gadam, 2018). Smart parking, as seen in the city of Barcelona (Spain) and Busan (South Korea), is further enhancing stakeholder experience by helping drivers find a vacant lot, parking managers in maximum utilisation of parking space, and enforcement agencies identify density violations and illegal or improper parking (Biyik, et al., 2021).

- **Air Quality**

City air quality management systems are using AI to forecast precise pollution levels based on measured values and weather data from the past. Heavily polluted cities in China and India (Meng, 2020) are increasingly using AI to identify hotspots for heavy air pollution. Such data generated are also being used to understand long-term exposure risks to health and the disparities arising from socio-economic status to improve environmental justice delivery (Kingery, 2021). In regions where data is inaccessible due to the absence of sensors or data in the public domain or even because the area is uninhabited, governments are trying to utilise satellite imagery and meteorological projections to model fine particle concentrations. Singapore is also using low-cost options such as predicting pollutant levels from photos by recording the time and place where the photo was taken and the positioning of the camera, which is then used to train an ML algorithm for prediction analysis (Rutkin, 2016).

- **Waste**

In a world that generates 2 billion tonnes of municipal waste annually and is poised to reach 3.4 billion tonnes in another 30 years, waste management is crucial and mandatory (The World Bank, 2018). Bergen, Norway, uses an underground pneumatic waste collection pipe network to reduce waste-collecting vehicles on the road and optimise resources through sensors at collection points that use laser technology to capture the weight and volume of waste picked up. Residents are taxed per the volume of waste generated (Alonso, 2022). AI lab in Granada uses data generated through bins fitted with sensors to optimise and prioritise waste collection routes, tremendously reducing pollution and noise levels (Ferrovial, 2017).

- **Water**

AI algorithms are widely applied in improving water distribution systems through 'smart metering' to improve efficiency gains and reduce non-revenue water loss. Smart cities are increasingly employing 'Supervisory Control and Data Acquisition (SCADA)' aided with sensors to feed data on two crucial aspects –first, in selecting limited yet pertinent monitoring points to maximise information content while reducing redundancy (observability analysis), and second, real-time monitoring of the network, especially at pumping stations or flow control valves, to optimise the overall energy requirement and also help monitor the quality of water (operational analysis) (ADB, 2020). In partnership with Huawei, the city of Yingtan, China, has installed 130,000 smart water meters, which have reduced the leakage rate from 20% to 12%, resulting in an annual water saving of 2.4 million tons (China Focus, 2021).

- **Housing**

Building Information Modeling (BIM) is used to create "multi-dimensional models of infrastructure projects in a virtual simulation before these projects are executed on-ground"(The Geospatial, 2020). Cities are increasingly using AI-integrated BIM for risk assessment, improving construction project safety and productivity. Since long, local governments have struggled to standardise building plan approvals, and new AI integration tools such as robotic process automation to create efficient building designs, seamlessly incorporate floor plan changes across every structural detail, and help monitor the construction of buildings whose permit have been issued in real-time (Buncio, 2019).AI-empowered BIM modeling is increasingly being applied across the USA, United Kingdom, Denmark, Germany, the Netherlands, and Singapore under the broad umbrella of city information modeling (Sielker & Allmendinger, 2018).

• **Security**

Deep learning algorithms are being deployed to design early warning systems for 'ecology, thermo-acoustics, climatology, and epidemiology' that uses extensive data to determine naturally occurring tipping points and aid in better planning of emergency response systems (Bury, et al., 2021). Such AI-enabled technologies are being used in cities of Taiwan to mitigate flood-related disasters (Yand, et al., 2019). Researchers at MIT have developed an artificial intelligence platform called AI2 that helps predict cyber surveillance by predicting "cyber-attacks through continuously incorporating input from human experts" (Conner-Simons, 2016). Many police departments in Australian cities use facial recognition service that combines machine learning with various data mining and collecting practices to generate people's identity from online photographs (Goldenfein, 2020).

• **Community Engagement**

Several city governments in the US are increasingly using social media and various engagement platforms powered by chatbots to address several service delivery discrepancies and information dissemination. In turn, these channels also generate a feedback loop that is used to improvise current levels of system efficiencies (Desouza & Bhagwatwar, 2014). Such engagements also empower decision-making, policy developments, and crowd sourcing of possible solutions to city management problems (Kankanamge, Yigitcanlar, Goonetilleke, & Kamruzzaman, 2019). The city of Amsterdam has a Smart Citizens programme that recruits people to participate as data agents sharing their experiences on various city functionalities and improving city performance indices on environmental sustainability and quality of life (Bokhari & Myeong, 2022). AI applications in community engagement can also help city makers target the right approach to communicating in crisis and emergency by using sentiment insights through descriptive textual analytics of identified keywords through social media posts (Samuel, Ali, Rahman, Esawi, & Samuel, 2020).

Literature Synthesis

The overall assimilation of various AI usage in augmenting service delivery functions of the city government has been summarised in Table 0.2, along with the kind of AI techniques or tools that support the current usage. While significant feats have been achieved in acclimatising everyday non-machine and human functions through AI applications, the horizon is still young, with opportunities to completely transform the spatial and temporal space with improved learning and technological advancements.

Table 0.2 AI Use Cases to Improve Public Service Delivery

Sectors	Application	AI Technique
Energy	Energy Consumption Trackers	Convolutional Neural Network – home energy management
	Smart Streetlights	Internet of Things and AI (IoT)
	Smart Grid	Deep Learning – load forecasting Deep Neural Network – power grid stability assessment
Mobility	Intelligent Traffic signals	Deep Reinforcement Learning (DRL) algorithms
	Smart Routing	Big Data
	Autonomous Driving	Neural Networks and Deep Learning
	Smart Parking	Internet of Things and AI (IoT)
Air Quality	Air Pollution and emission reduction	Machine learning (Artificial Neural Network, Adaptive Neuro-Fuzzy Inference System, and Evolutionary Algorithms)
Waste	Optimising waste collection routes	GIS - based Genetic Algorithm
	Digital payment for waste disposal and recycling	Computer Vision and Machine Learning
Water	Smart Water Meters - Leak detection, Water Quality Monitoring, optimising energy requirements	Deep learning (Hydraulic Modeling), decision tree
Housing	Building Information Modeling	Computer Vision and Machine Learning
	Building Permit Processing	Robotic process automation
Security	Early Warning Systems and Emergency Response Optimisation	Deep learning
	Predictive policing and crime mapping	Computer Vision and Automated Speech Recognition
	Cyber Security	Machine Learning (Neural Network)
Community Engagement	Digital Citizen Services	Natural Language Processing Sentimental Analysis
	Civic Engagement Applications	
	Social Media Communications	

Source: *Author's Compilation*

Method

This paper weaves a coherent narrative on AI and its application to smart cities by putting in order seemingly disparate and abstruse events into a consistent story. With this end, it uses the case-study method from an empirical lens. The study does not employ a comparative analysis, but, offers a rich examination of contemporary urban experiments in building smart cities. Seen from an environmental resilience purpose, it also studies resilience in cities and the application of AI in the built environment, i.e., in new and existing urban forms. It uses secondary source data to understand current trends and proposes an in-depth examination of one of the AI applications in cities. Research in this field has transpired chiefly in the last decade. Hence, the paper collates diverse real-life examples of such AI applications to understand how urban dynamics adopt and adapt to the new vision of autonomous cities. It draws upon various AI applications to better appreciate the enormity of its use rather than focusing on an individual aspect alone.

In historical parlance, cities have always experimented with alternate ways of socio-cultural associations. In a much broader context, this paper looks at how contemporary urban projects are trending in the development and expansion of cities. Secondly, the report brings into perspective all that has been done through AI applications and prospects that may emerge in rapidly urbanizing cities of the Global South aspiring to grow and simultaneously grow intelligent and green. Hence, instead of prescribing a definitive technology, the paper takes a mid-ground to explain AI's possibilities and maintain its potential for future improvisation and innovation.

Discussion

At the confluence of digitalisation and urbanisation, this study has endeavoured to investigate how the blueprint of smart cities is transforming the future. The various use cases of AI reflect how public service delivery has been magnanimously improved, which in turn has contributed to livability, sustainability, and reduced consumption. Coupled with decision-making and policy formulation innovations, AI has helped city managers overcome human competencies' limits with extensive use of data and algorithmic optimisations. The literature study reflects how AI technologies are helping achieve sustainable development goals in line with climate change global goals. Summarising the advantages of AI applications in cities, it is deduced that:

- AI has cut costs, time, and resources by improving system efficiencies and reducing redundancy in service delivery.
- AI algorithms have tremendously improved policy decisions and problem-solving capabilities. City innovation labs foster constructive

links between stakeholders to improve natural resource management via participatory governance.

•   Although the use of AI in the urban context is increasing daily, consolidated studies and research efforts are still fragmented across sectors. Integration of available knowledge and predicted future can tremendously improve the management and functioning of cities powered by technology.

Although AI has been able to embed systemic efficiencies in public service delivery, it comes with a downside of being a costly venture to "train and develop, both financially, due to the cost of hardware and electricity or cloud compute time, and environmentally, due to the carbon footprint required to fuel modern tensor processing hardware" (Strubell, Ganesh, & McCallum, 2019). Improvements can be made to streamline the involved expenditures by using cost-benefit analysis for various models, including the trade-offs of switching to cloud computing, such as increased electricity consumption. Another concern with AI's intensive use is understanding legalities and liabilities that may arise in mishaps and undue uses, such as cyber-attacks or biases due to system-generated prejudices. Apportioning liability to an artificial agent will require urban decision-makers to fathom the role such agents may have played in the situation and whether the penalty may be extended to the principal operating the AI tool (Chopra & White).

Weakness, Future Research

Smartcities cannot achieve sustainability unless their supply chains are environmentally and socially sustainable. Therefore, AI applications, in a narrow sense, cannot bring systemic efficiencies that can be experienced in a much larger geography. Concerted efforts in developing advanced urban AI have the potential to address the biggest challenge of our times – climate change. However, current applications target specific use cases, like air quality monitoring or improving energy efficiency. Second, AI is an expensive venture that remains asymmetrically unavailable to the digitally divided world both at the international scale – global north and south – as well as national scale - metropoles and towns or countryside. Autonomous cars may remain inaccessible to many as an investment decision and an option for daily use, given the expenses it will accompany in use and maintenance. It has the potential to divide the rich and the poor further. Besides the convoluted ethics, inadept legislations, and potential for privacy violation, AI can also become a threat if it falls into an anti-social network. Laws will have to be predictively vital in addressing concerns of future misuse. If urban activities become the bread and butter of robotic entities, the city's social fabric will be irrevocably altered. Although AI cannot populate cities and requires human brains to scope out its work, it will undeniably be the end of towns if it replaces humans entirely in the urban equation.

Conclusion

The concept of a futuristic city has been reinvented several times in utopian urban plans, radical architectural designs, and even science fiction. Human ingenuity has reconceptualised the city in many forms since time immemorial. Be it prophecy, speculation, or simple entertainment; such visions have infiltrated the general consciousness, set grand expectations, and perhaps caused some disappointment at the substandard world we are stuck with. However, some past ideas of the future city have materialised or at least influenced the development of the urban environment. The concept of smart cities is deeply embedded in technological innovations that can improve public service delivery and augment the overall quality of urban life. Technology helps achieve efficiency in cost and time while simultaneously bringing quality assurance by fixing accountability on service-delivering agencies. A big part of this revolution has been made possible due to open data and associated solutions, as well as a complete feedback loop that helps, in turn, to improve service provision.

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Breaking Ice, Moving Mountains: A Case Study on Overcoming Hurdles in Implementing Jal Jeevan Mission in Ladakh

Ajeet Kumar Sahu

Abstract

Jal Jeevan Mission (JJM) was launched by the Prime Minister on 15th August 2019[1] with an objective of improving the quality of life in rural areas. Coinciding with it, the new Union Territory (UT) of Ladakh also came into existence few weeks later[2]. Despite being a new UT, with only 3.31% saturation[3] of Household (HH) tap connection at the time, Ladakh resolved to achieve the target a bit ahead of the national target[4].

The Himalayan Challenge

The administrators soon realised that the implementation of JJM in Ladakh was not an easy task due to its harsh climatic and topographic conditions. Ladakh falls in high altitude trans-Himalayan arid but extremely cold region[5] with vast geographical area and extremely low population density (2.8 person/Km^2)[6]. Sparse pollution, scattered villages, extremely low annual precipitation (Average 80 mm/annum), extreme cold conditions (Average temperature range -35 to +30 ^{0}C) make functional tap water connection less feasible. Limited working season (six months) and limited connectivity (no rail connectivity and road closure for five months every year) further affect the supplyofresources[7].

These challenges were aggravated with limited capacity of staff in the novice administrative unit, still grappling to find its feet in the COVID period. The administration spent its first-year in strategy and modality of and hired a Mini Ratna Central Public Service Undertaking (CPSU) as a technical consultant to assist and prepare DPRs[8].

Mr Bala was assigned the additional task of JJMas Administrative Secretary besides his other assignments and reached Ladakh in August 2020. However, he soon tested COVID- positive, and started focusing on the tasks only from September 2020. Soon, Mr Bala realised that no progress towards JJM implementation had been made till then; the staff was non-committaland lacked capacity and motivation. Everyone seemed to await a charismatic intervention from the consultant CPSU. COVID restrictions had further aggravated the problem and developmental works had been paralysed.

Clearing Cognitive Cobwebs

After initial review and interaction with the stakeholders, Bala sensed widespread 'not possible' sceptical mind-set as the first stumbling block in the rollout of the scheme.

Firstly, local Public Health Engineering Department (PHED) engineers had strong doubts about the feasibility of tap-watersupply scheme in Ladakh due to its climatic-topographical adversities combined with a lack of technical knowledge about running water supply schemes in extreme cold climate. Bala with help of National JJM (NJJM) team and other experts organised several brain storming sessions, workshops and capacity-building seminars. He firmly explained to the engineers that there was no option but to implement the scheme and made them realise that it was a golden chance for them to contribute in the development of their own society and region. He also reiterated the flexibility of the scheme as it only talks about the outcome and left the modalities for the implementers to decide.

Slowly engineers started working on the scheme, few with motivation and others because of the pressure of Mr Bala. However, there was a widespread confusion about the technology to be used. They looked for support from the consultants for suitable technology[9]. Consultants, on the other hand, had difficulties in staying in the harsh climate of Ladakh and serving in a time-bound manner. Bala himself conducted multiple meetings with the consulting firm but found them non-committal. One or two Detailed Project Reports (DPRs) prepared by them were found to be highly expensive and had been prepared ignoring existing resources. Bala felt that depending on the consulting firm alone was probably not a good idea. Though he was not sure about the capacity of his own engineers but believing more hands would help, he motivated them to take charge of executing the works on their shoulders. He asked them to start preparing the DPRs by relying on the in-house knowledge, expertise and experience and discussing the solutions with locals/PRI members. With his previous experience of working in Ladakh, he reminded them of a few good experiments they had conducted in the past. This approach of localised brain storming worked and engineers came up with multiple potential solutions[10]. Based on these solutions, the DPRs were prepared quickly by the departmental engineers. Since the consultants had not given any tangible results, Bala decided to get the DPRs prepared 100% by PHED engineers and disengaged the consultant.

To improve confidence levels of the engineers and to check feasibility of the suggested solutions, a pilot scheme of '24X7 water supply' was taken up in a small peri-urban area of Gangles. He took help of a few experts and NGOs. The pilot exhibited encouraging results even during peak winters and the 24X7

water supply become a reality in targetedhabitation[11].Though small, this win boosted the morale of departmental engineers.

Defreezing Contracting Conundrum

The next challenge was posed by contractors. They were highly sceptical about the financing of the scheme. Initially, they distanced themselves from the bidding, and the department had to bid multiple times to get a response (in a few schemes, tenders were floated for six-eight times). Bala engaged the contractors in discussions and learnt of some pending legacy issues i.e. languishing work due to lack of funds, and non-timely payments. The contractors were also sceptical about the stringent deadlines in JJM. To resolve these doubts, Bala undertook various confidence-building measures. The department organised regular sessions with the contractors to navigate through their issues. They were provided advances promptly and the engineers were directed to ensure timely payment of bills. This improved cash flows to the contractors; showing promising returns; as they started participating readily.

Mountainous Efforts

Due to the harsh weather and geographic challenges, transportation of construction materials and labourers to remote areas posed another challenge. To overcome this problem in difficult areas, contracts were split into two parts in some of the cases viz; Material and Labour/work component. Materials were procured on GeM and provided on site by the department, and the labour component was tendered separately. As most of the sources were in inaccessible areas, material had to be lifted at the site manually with help of locals, crossing major geographical hurdles. Where labourers could not reach, choppers were used[12] to supply materials at the site.

Come Together to Win

A rather unexpected challenge emerged from the villagers themselves, the prime beneficiaries of the scheme. Despite prior consultations, villagers doubted the success of the water supply schemes in extreme winters due to their previous experience. With the fear of damage to their houses due to the bursting of pipes in winters, villagers refused to participate. Besides, due to a very short agriculture season, the villagers refused to allow laying of pipes through their fields. Rumours circulated that with the laying of the pipeline, their fields will become barren. PHE team faced violent and abusive encounters and were even driven out of the village in several instances.

To convince the villagers, the involvement of all the political leaders was solicited including Sarpanch, Block Chairman, Counsellors, Chairman Hill Councils and the Hon'ble MP. Two-day workshops were organised for the PRIs in both districts with help of NJJM experts and officers[13]. These

workshops helped in breaking the ice and the scheme was projected as a 'people's movement' rather than a government scheme. This led to a complete narrative shift - of people owning the project. With the efforts of public representatives and officers, slowly, people started cooperating. They deputed representatives amongst themselves to monitor the execution of the scheme on a day-to-day basis. Ladakh administration constituted Block level Monitoring Committees, in addition to the already existing Village Committee and District Mission, to over see the implementation. To drive up healthy competition, rewards for Panchayats and blocks were announced[14] to encourage villagers to achieve the status of 'Har Ghar Jal'.

Galloping Governance Challenges

Leh and Kargil, being remote districts, always had minusculead ministrative machinery and infrastructure. Thus, Bala had a challenge of small workforce, with limited capacity. Though few engineers were hired via outsourcing, they were freshers and lacked experience.

As a way out, the entire administration was looped into implementation of JJM with Deputy Commissioners in the lead role and SDMS/BDOs in their support. Hon'ble Lieutenant Governor started taking fort nightly reviews to eliminate obstacles in implementing the scheme. He declared that the performance of Deputy Commissioners would be evaluated on the sole parameter of their success in JJM. All PHED engineers were denied leave till work of JJM was allotted 100% in their respective areas. These measures helped in fastening the pace of implementation despite limited resources.
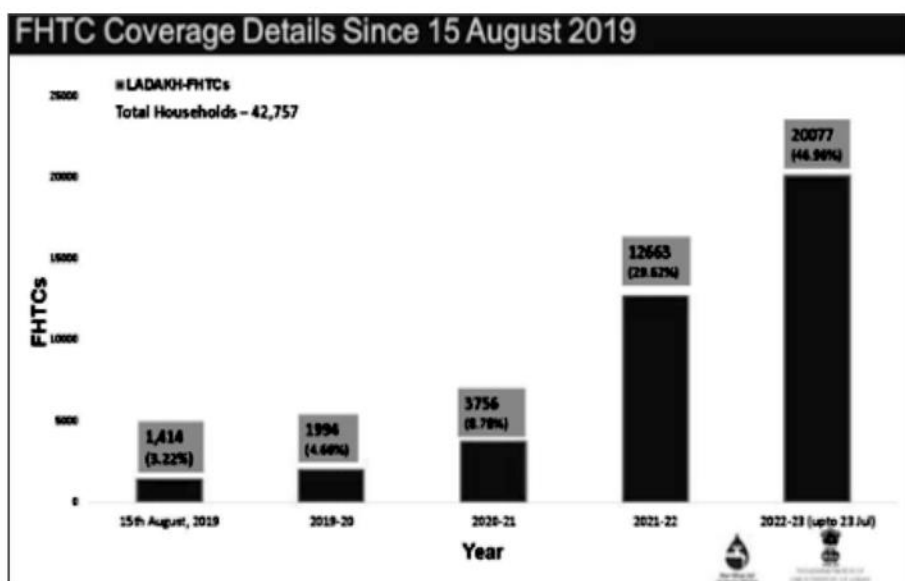

Figure 1: Tap Connection Progress in Ladakh[15]

Warm Days Ahead

Although the scheme was marred with challenges and there were delays in execution, currently the administration and people of Ladakh are fully geared up for completing the scheme in a time-bound manner. 100% of works have been allotted, resources have been mobilised and work has begun in almost all locations. Around 49% households are now connected with piped water (see Picture-1). Since the completed schemes remained functional even during winters, it has strengthened optimism in all stakeholders. In the meantime the efforts of Ladakh were recognised by the Ministry and showcased (Picture-2) in the Republic Day Parade16 which boosted the morale of engineers and villagers alike. Bala still has to discern suitable solutions on quality aspects and to take measures for sustain ability of sources and structures. Bala still needs to work hard to achieve the mission objectives but he has scaled the mountain of skepticism as people of Ladakh now find nothing impossible in JJM[17].

Figure 2: JJMTABLEAUOFMOJSONRD-2022

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Case Study on Resolving Critical Connectivity Issues in the Inaccessible Naxal Affected Areas in Rayagada District: Challenges and Learnings

Nitin B. Jawale

Background

Rayagada, which was a part of undivided Koraput district and falls in the KBK (Koraput- Bolangir Kalahandi) region of Odisha, was earlier known for its poor development indicators. The district is dominated by tribal communities, including the Particularly Vulnerable Tribal Groups (PVTGs), who inhabit the hilly and extremely difficult terrain dominating the landscape of the district. Most of the habitations are located in valleys and hill tops of the ranges of the Eastern ghats, separated by many rivers and *nalas* (rivulets), making this region one of the most inaccessible in the country. The situation becomes even more challenging in times of emergency, for the public to avail the services and the administration to deliver the same. The situation in Rayagada was further complicated by the Left Wing Extremism (LWE) which thrived on these connectivity and communication challenges. There were many areas in the district separated by these geographical barriers, mostly rivers and rivulets, from the nearest town or centres of public utilities like hospitals, educational institutions, etc.

One such challenge in the district presented itself just about two kilometres (kms) from the district headquarter town by the Nagavali river. The deep river valley separated the villages in eight *Gram Panchayats* namely, Karubai, Bado Alubadi, Baising, Dangolodi, Durgapadu, Mirabalir, Tolo Alubadi and Erkubali from the district headquarter town and the inhabitants of this area who belonged almost exclusively to tribal communities, had to detour about 25 kms via Kolnora to reach the district headquarter town for some of the most basic services. There were instances of patients dying on the way, including some cases of maternal deaths, as it took a very long time for reaching the nearest medical facilities, in spite of the fact that these villages were within the range of five kms[1], taken as the crow flies, from the Rayagada town. The local communities in the past, with a Self Help Group, had constructed a skeletal bamboo bridge[2] which, though served the purpose in some ways, was extremely unsafe[3].

Objectives and Strategy

Given the conditions above it was the need of the hour to take measures to alleviate the people's misery and that too as soon as possible. However looking at the various challenges any conventional connectivity bridge project proved far too costly and time taking. It had become imperative to come up with a low cost solution which could be executed in a shorter time and which would still fulfil the needs of the people in the most optimal manner, the way for which was already shown by the make shift bamboo bridge constructed by a local SHG.

Rayagada happened to be, at that point of among the districts highly affected by LWE insurgency[4]. The Union Government had from 2010 onwards come up with a scheme called the Integrated Action Plan (IAP) for Naxal affected areas, in which it was envisaged to give full autonomy to the district administration in the affected areas to conceptualise and implement the projects it deemed necessary for tackling development challenges, which would help reduce the spread and intensity of LWE activity in the region. The scheme was to be implemented through a committee consisting of the District Collector, the Superintendent of Police and the Divisional Forest Officer and was empowered with the freedom and flexibility for the stated goals of the scheme[5].

Lack of connectivity was the biggest factor which contributed to the growth of the LWE movement. Apart from security forces, even the welfare machinery of the State found it extremely difficult to reach the people to deliver even the basic services. This contributed to the growth and in sustaining the LWE movement in the region. Therefore, a big thrust was given to resolve the connectivity issues in this district by the IAP committee. No other connectivity

challenge was as bigger and as critical as connecting the almost cut-off areas of the in eight *Gram Panchayats* mentioned above with the district headquarter town.

Deterrents

Since the interior areas of the district were such that a large number of sparsely populated habitations were scattered on either sides of the rivers and rivulets with fast flowing water, it was neither feasible nor economical to plan a conventional bridge or even install a culvert, more so in such site under consideration.

With the State level agencies, the major deterrent for undertaking a conventional bridge project was not the shortage of funds but the nature of the terrain with a deep valley in which the river flowed and the nature of the soil, which was prone to erosion, on the either sides of the banks. The span of the river was more than 100 meters and the height of the supporting pillars that would have been required to be erected in the fast flowing waters would have been more than 100 feet[6]. This made any conventional bridge project exorbitantly costly. Therefore, inspite of persistent pubic demand, it became difficult to address this problem in the best possible way.

After deliberating over a number of designs, the IAP committee settled for a pre-fabricated bridge as it was the most economical and time saving solution given the resources at hand.

The challenge, however, was to find an executing agency, as there was only one suspension bridge built in the State of Odisha at Dhabaleshwar, in Cuttack district, by the State level agencies in 2006[7]. There was none that was conceptualised and executed exclusively by the district administration in the State of Odisha, at least. The State departments were requested to undertake the project, but since the previous such project at Dhabaleshwar, in Cuttack had resulted in allegations of irregularities, the State agencies were in no mood to consider taking up the project, much less at the request of the district administration.

Besides, just downstream, the site proposed for the suspension bridge where the existing bamboo bridge stood, floods and an under construction hydroelectric project had in 2007caused immense damage to the *Haatipathar* site, a huge natural formation of stone boulders resembling elephant back, in the Nagavali river, which was a local heritage and big tourist attraction[8]. The damage had caused public outcry and the project had to be shelved. This made the State agencies all the more sceptical towards any project envisaged in that place. All attempts to get a State level buy-in for this project went futile, as it was perceived as an overambitious project at that point of time.

Execution challenges

After much search, finally, the district administration was linked with the *'Bharat Grama Sethu Pratisthana'*, a trust involved in constructing low-cost connectivity solutions with the motto of using engineering skills for social causes. BGSP was headed by Girish Bhardwaj, who was instrumental in executing these low-cost bridges in rural parts of the country, especially in Southern India, and more precisely in Karnataka[9].

However, the district administration still needed a government agency for undertaking the formalities for execution of this project, as the work could not be directly allotted even to an organisation like BGST. After much persuasion, the Odisha Police Housing& Welfare Corporation Ltd. agreed to come onboard[10] to do the necessary formalities to execute the project on turnkey basis, overcoming the biggest hurdle for the execution of this project and bringing to life the hopes of this project moving beyond theory and drawing board.

The estimated cost of the suspension bridge was worked out at Rs. 1.04 crores for a span of 151 metres (495 ft) and is 30.48 metres (100.0 ft) above the river below.

Risks and dilemmas

It was an easier option to look the other way and leave it to the Works or Rural Development department (which had a dedicated road development wing) of the State to deal with this issue in their own way. Other than procedural complexities in executing such a project, there were immense personal and professional risks in undertaking a project of such dimensions and nature, which was unprecedented for a district administration, in Odisha at least. There were uncertainties that inspite of getting an executing agency, there could be some unforeseen factors that would hamper the execution of the bridge project. Adversely, any untoward incident during execution, which was a big possibility given the range of natural disasters in the State of Odisha, including this region faces, would have meant a huge dent and blemish on the career for the officials of district administration, and the IAP committee members in particular. The biggest and real risk was that of post completion damage either due to faulty execution of forces of nature.

There were also fears of allegations of malpractices in the process and execution of the project, given the huge autonomy that the three officials of the district had in execution of this off beat complex project. This had the potential of being a huge reputational risk in the initial stage of the service which would have been career damaging.

Whichever way one looked at these risks, the situation was sufficient enough to give sleepless nights even after completion of the project and therefore a

deterrent strong enough to make the district administration feel inclined to give up the project even before it started. However, irrespective of the magnitude of these risks, the fact that this project, when completed, would transform the lives of a huge population, motivated the district administration to take up these risks with all its challenges, as it was once-in-a-lifetime opportunity to make a huge positive impact and for greater public good.

So the district administration left no stone unturned in execution of the project. The project, from the drawing board stage to initiation of the work took more than a year, but was completed in duration of just above three months and was open to public in the end March 2012.[11]

Success, learning and legacy

This project was completed in a time-frame of just above three months without any hitch. The success of this project not only proved to be a story of a low-cost engineering marvel, but also one in which the determination of the district administration was tested to its limits against all odds. This also was a befitting example of the redemption of trust reposed by the governments on its premier institutions and that when given the necessary freedom and flexibility with the funds, district administration could work out wonders. Two more such bridges were built by the district administration in Rayagada district in subsequent years[12].

The suspension bridge is still in serving condition and being put to good use, inspite of the fact that a conventional bridge had come up just 5 kms upstream the site over the Nagavali river after few years. The success of this suspension bridge project paved way for many such low-cost prefabricated bridges in different parts of the State. The State level agencies which were earlier sceptical

about such projects went on to undertake many such low cost bridges with technical support of organisations such as Garden Reach Builders and Engineers Ltd. Kolkata[13].Thoughthe bridges built by them were shorter Bailey bridges, not the suspension variety, it established the norm of low cost connectivity solutions for such remote inaccessible and sparsely populated areas, in the years to come. This project also found its place as a success story in the documentation of the Integrated Action plan[14] by Govt. of India.

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CONTENTS