Social Inclusiveness of Indian Science Centres and Museums – A Snapshot through Case Studies (Part-I)

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The science centres and museums in India have become a part of the social fabric in disseminating knowledge of science and technology to the people in a non-formal manner. Need for this kind of non-formal education is becoming essential with the passage of time and has become one of the most important sources of information for the people.

Science centres and museums play a significant role in combating social exclusion. In partnership with other agencies, these institutions lead the way for the whole cultural sector in pursuing inclusive agenda. It is ironic that this role, despite its long pedigree, is not the one which is widely known. Part of this explanation is that science centres and museums have not been vociferous in promoting this aspect of their work.

Social Inclusion is at the core of the system of values of the science centres and museums in India. It is a key driver in all decisions relating to strategic vision, policies and programmes in such institutions. A study is presented here in two parts to highlight the current scenario, based on survey of 41 Indian science centres and museums in respect of social inclusiveness in different perspectives.

Objectives of the Study

This study attempts to address certain questions in the present context:

* In our effort to make our centres more modern and more attractive, are we leaning towards more exotic and expensive gizmos?
* Are we making them stunning beauties by excluding social activism as the mundane redundancy?
* Are we creating environments and programs skewed only to the able, empowered and affluent?
* Are we friendly enough to the differently able, to people with special needs or to special ethnic, economic or language groups?
* And above all, are the society and locality supporting a centre being led to any kind of empowerment by the programs and presentations of the centre?

The task, we anticipate, would be daunting and may take significant feedback-oriented reshaping in course of our investigation and introspection. As a first order

study, we intend to focus on exploring how a museum/ centre is reinventing itself as an agent of social inclusion and to comprehend what is the type of operational model that these centres are following to occupy the rapidly changing landscape of social inclusion policies. This is followed up by intensive auditing in a select group of science centres and museums with the help of a specially designed audit checklist.

In the second part, we would also like to investigate through questionnaire survey and statistical analysis as to what extent the concept of social inclusion would require a new approach by museums and in what ways these institutions could contribute towards inclusion policies.

Accessibility: Big Issues for the Social Inclusion Practices in Science Centres and Museums

Access is defined as something that is made possible when physical, cultural, social, financial, intellectual, psychological and emotional barriers are removed or reduced. All people have the right to freely participate in the cultural life of the community, to enjoy the arts and to share scientific advancement and its benefits. This is stated in the 'Universal Declaration of Human Rights'. Merely setting up of museums without ascertaining whether the services and resources of these institutions would be utilized by the people does not justify the social role of public museums, especially in a democratic country like India, where the government owns a majority of museums. The museum resources must be accessible to all.

To eliminate barriers and ensure equality of access, accessibility has a number of forms. Museum accessibility can be classified into five types- physical, sociocultural, economic, sensory and intellectual/ learning. With more and more such institutions going virtual and web-based, digital accessibility is another new classification that has emerged now.

Social Inclusion steps by Indian Science Museums and Centres

In order to understand the social exclusion and to promote inclusion in science centres and museums, it is useful to briefly identify the role that science centres

and museums can play in tackling these issues. For some people, the potential role of museums is confined to broadening of their audience profile. In fact, "Museums for all" psychology acknowledges that efforts are required to be made to identify and remove the barriers that exist to exclude many groups from museums.

Barrier-free Science Centre / Museum

Intellectual acceptance of the exhibition content to all strata of society is important for science centres/ museums. It is also necessary that the exhibits and collections are to be made physically accessible to all the visitors. Different initiatives have been taken to combat physical exclusion within the science centres / museums in India.

Fig. 1. Accessible Exhibition areas at VITM.

Fig.2. Accessible Exhibit content 'World in Darkness' gallery at BITM.

Ramps have been provided within the gallery for easy maneuvering of wheelchair bound visitors. Exhibit labels have been provided in more than one sensory channels. In Birla Industrial & Technological Museum (BITM), Kolkata, a special exhibition has been introduced for the visually challenged visitors, in Regional Science Centre (RSC), Guwahati, a medicinal plant garden with special pathways and information labels in Braille is provided for the visually impaired.

Fig. 3&4. Pebbled pathways for visually impaired visitors with labels in Braille at 'Medicinal Plant Garden' at RSC, Guwahati.

Bridging the gap in understanding

In India, science centres and museums organize different programmes and activities round the year in dispelling widespread superstition about celestial events or diseases. These institutions also provide a platform for social interactions on scientific issues that encourage and facilitate better understanding of science.

It is often argued in different contexts that cultural institutions can act as the trusted incubators for change by providing a variety of information sources, offering challenging and participatory experiences. But significantly, science centers facilitate visitors to engage

topics on their own terms in their own capacity as expert informants, as opposed to the old pedagogic paradigm as authorities. In addition to the evidence of the knowledge and understanding development, considerable instances have been collected from visitors to science centers practicing and developing skills of exploration, observation, interpreting data, sharing ideas, and other skills directly related to scientific belief.

Fig. 7. Mobile Science Exhibition programme in a School.

Fig. 5. Creating scientific temper by demystifying various myths and superstitions prevalent in the society (scene from Kurukshetra Panorama and Science Centre).

Fig. 8. Summer Hobby Camp.

Fig. 6. Visitors from a special religious group in 'Mock up Coalmine' at BITM.

Reaching out to the Target groups

The school students happen to be the prime target group for a Science Centre/Museum. Science Centres in India have taken up various initiatives like Mobile Science Exhibitions, Creative Ability Centre, Science Fairs, Science Drama, Science Seminars and so on to reach out to this specific group.

Fig. 9. Science fair.

Fig.10. Preparation for Science Drama competition.

Fig.11. Presentation of a participant during National Science Seminar.

Fig.12. Computer training for Senior citizens and women at Regional Science Centre, Guwahati.

Engaging various social groups

Indian Science Centres have taken necessary steps to include all strata of society to ensure inclusiveness. Computer training programmes for senior citizens and women, various activites for physically challenged children, programmes for personal development and programmes to combat the problem of unemployment etc. are examples of some of these initiatives.

Fig.13. Sit & Draw competition for physically challenged children at BITM, Kolkata.

Fig. 14. Community Training programme at District Science Centre (DSC), Purulia.

Social Inclusion Audit Checklist - Is Your Science Centre / Museum 'Socially Inclusive'?

Science centres and museums were created on the basis of this philosophical model of inclusion almost half a century back in this country. And it is yielding some results. However the mode of operation vis-à-vis ground realities is required to be studied as well.
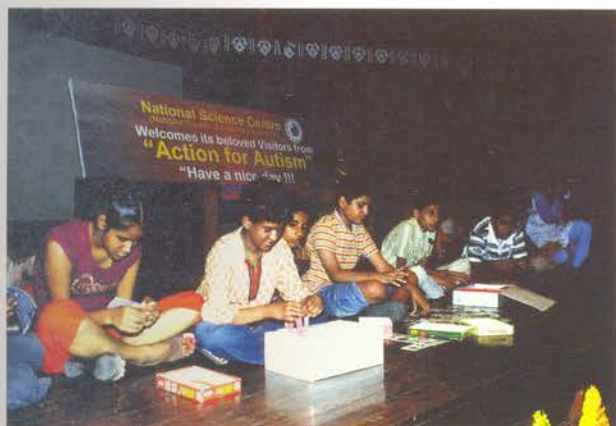
Fig.15. Programme for Autistic children at National Science Centre (NSC), Delhi.

Fig.16. Professional training to combat unemployment at Visvesvaraya Industrial & Technological Museum, Bengaluru.

Fig.17. 'Word-of-Mouth' – a publicity campaign through auto drivers initiated by Regional Science Centre, Calicut.

As indicated in the preceding sections, 'accessibility' is considered as the first step towards social inclusion of a Science Centre / Museum. A rating is adopted here using a checklist of 'Social Inclusion Audit'. This checklist, as furnished in the Appendix-A, is devised taking into consideration the 'Guidelines and Space Standards for Barrier-Free Built Environment for Disabled and Elderly Persons' of Central Public Works Department (1998), People with Disability Act 1996 of Government of India, 'Smithsonian Guidelines for Accessible Exhibition Design', 'Open to All? Science Centres and Museums in the UK: Strategies for Social Inclusion' by Anwar Tlili of Centre for Informal Learning Schools, King's College, London, the 'Museums and Social Inclusion, The GLLAM Report' (Group for Large Local Authority Museums, October 2000), research undertaken by the Research Centre for Museums and Galleries (RCMG), Department of Museum Studies, University of Leicester. In the later stage, field survey was carried out in a select group of science centres and museums.

Inclusion Audit in Science Centres / Museums – A Report

Survey outcome for BITM, Kolkata

BITM secured 26 x 2.5 = 65 out of 100

Accessible. More steps need to be taken for greater physical accessibility rather than intellectual accessibility.

A glimpse of accessibility/inaccessibility of BITM, Kolkata

Fig.18. Ramp - as accessibility sign for wheelchair bound visitors.

Fig.19. 'Signage' at strategic locations but absence of symbolic representations.

Fig. 22. A glimpse of an exhibition specially designed for visually impaired.

Survey outcome for Science City, Kolkata

Science City, Kolkata secured 29 x 2.5 = 72.5

Accessible. More initiatives need to be taken for intellectual accessibility.

A glimpse of accessibility/inaccessibility for Science City, Kolkata

Fig. 20&21. Different programmes are conducted targeting special groups.

Fig. 23. Ramp at the entrance of Dynamotion Hall.

Fig. 24. Accessible water faucets.

Fig.28. Poor Illumination, visually inaccessible artifacts, samples etc.

Fig. 25. Signage at strategic locations.

Fig.29. Glare from exhibit cabinets etc.

Survey outcome for Indian Museum, Kolkata

(Partial information available)
Indian Museum secured 7 x 2.5 = 17.5 (out of 72.5)

Inaccessible. To the large section of visitors, this museum is intellectually as well as physically inaccessible. Considering the importance of a 'Natural History Museum', major accessibility measures need to be taken.

A glimpse of accessibility/inaccessibility of Indian Museum

Fig. 26 & 27. No ramp is found at entry or exit.

Results of Social Inclusion Audit for the Select Group of NCSM Science Centres and Museums

Based on the forty parameters as per the checklist (given in Appendix-A), ratings of some of the science centres and museums in terms of accessibility have been evaluated. The following are the results:

Name of the Centre	Accessibility Score
Regional Science City, Lucknow	33 x 2.5 = 82.5
National Science Centre, Delhi	31 x 2.5 = 77.5
District Science Centre, Purulia	28 x 2.5 = 70
North Bengal Science Centre, Siliguri	27 x 2.5 = 67.5
Srikrishna Science Centre, Patna	25 x 2.5 = 62.5
Arunachal Pradesh Science Centre	25 x 2.5 = 62.5
Regional Science Centre, Bhopal	23 x 2.5 = 57.5
Visvesaraya Industrial & Technological Museum, Bengaluru	23 x 2.5 = 57.5
Digha Science Centre	22 x 2.5 = 55
Regional Science Centre, Bhubaneswar	20 x 2.5 = 50
Nehru Science Centre, Mumbai	20 x 2.5 = 50
District Science Centre, Dhenkanal	10 x 2.5 = 25
Bardhaman Science Centre	8 x 2.5 = 20

Conclusion

In Part-I of this article, an attempt has been made to ascertain the accessibility scenario of Indian science centres and museums as a part of studying social inclusiveness of this sector. In this phase, we undertook field studies, went through the statistics in respect of conducting different activities both inside and outside the institutions and finally initiated social inclusion audit in the select group after devising a checklist based on well-known standard practices. In Part-II, we propose to analyse the statistical data collected through questionnaire surveys in 41 institutions (including planetariums and natural history museums) and draw inference on the basis of this analysis.

Acknowledgement

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Appendix - A
Social Inclusion Audit (Checklist)

Sl. No.	Measure	Yes	No
Physical Accessibility Measures			
1.	**Provision of wheel chairs for physically challenged visitors**		
2.	**Provision of suitable ramps in the entrance and exit for the wheelchair bound and visually challenged visitors** (A ramp with 1:12 gradient and handrails on both the sides should be provided)		
3.	**Provision of suitable ramps in the galleries for the wheelchair bound and visually challenged visitors**		
4.	**Provision of lifts for physically and visually challenged visitors**		
5.	**Guiding/Warning Floor Material for persons with impaired vision** *Line-type blocks indicate the correct path/route to follow.* *Dot-type blocks provide warning signals, to screen off obstacles or other hazards, to discourage movement in an incorrect direction and to warn of a corner or junction.* *Warning strip should be placed 300mm at the beginning and end of the ramps, stairs and entrance to any door.*		
6.	**Sufficient space around the water faucets and toilets to make it easily accessible for wheelchair users** (Depending on the type of water faucet, a space about 700 mm high and 350 mm deep under the faucet to be provided)		

7.	Signage being provided at strategic locations regarding all the amenities		
8.	Floorwise key plans and Floor signage being provided for persons with short stature or wheelchair bound		
9.	Braille information plates being provided		
10.	The circulation route within the exhibition accessible according to the following requirements i) The circulation route must be at least 915 mm/36 inches wide for one-way wheelchair ii) For two-way routes, the minimum width is 1525 mm/60 inches		
11.	The circulation route clearly defined, well-lighted, and easy to follow and provision of sufficient light on objects to make them visible to all visitors (unless the light level does substantial damage to the objects)		
12.	Nearby seating arrangement in a corridor or in an adjacent gallery space		
13.	Exhibit cabinets / cases posing safety hazards to visitors		
14.	The colors and patterns of exhibition floor surfaces giving accurate information about the depth, height, and condition of the floor surface		
15.	Assistive listening systems provided in all public programme spaces		
16.	Both visual and audible fire alarm systems provided		
17.	Provision of fully accessible emergency egress from the exhibition spaces		
18.	Items in exhibitions (e.g. artifacts, graphics, props) visually accessible to people i) Mounting small items at a height not more than 1015 mm (40 in.) above the floor ii) Constructing the top of a case at a maximum of 915 mm		
19.	Items essential to the exhibition's main theme accessible to people by tactile examination (e.g. touching artifacts, reproductions, models) and/or comprehensive audio description		
20.	All exhibit cabinets / cases are within the viewing access to people who are short or seated as well as to those who are standing		
21.	Colors of / within exhibit cabinets / cases provide clear visual access to items inside		
22.	Colors for labels have a high contrast between text and background		
23.	Provision of sufficient light on labels to make them readable by all visitors and glare from cabinets / cases eliminated for those who are seated as well as for those who are standing		
24.	Controls for and operation of all interactives to be accessible and usable by all visitors		

Sl. Nos. 1 to 24 are conforming to the 'Guidelines and Space Standards for Barrier-Free Built Environment for Disabled and Elderly Persons' of Central Public Works Department (1998) & People with Disability Act 1996 of Government of India and 'Smithsonian Guidelines for Accessible Exhibition Design'

Intellectual Accessibility Measures			
25.	Exhibit content accessible at multiple intellectual levels (Simplified multilingual labels without jargons have been provided etc.)		
26.	Exhibit content presented through more than one sensory channels (Braille and voice over version of these labels to be provided etc.)		

Sl. Nos. 25 and 26 are conforming to the 'Smithsonian Guidelines for Accessible Exhibition Design'

Digital Accessibility Measures			
27.	Instructions for proper use of inter-actives to be accessible to all visitors (like font size flexibility)		
28.	Inter-actives and audiovisuals which do not have soundtracks with labels for people with low hearing capacity		
29.	Audiovisual programs and computer interactives that present information with images and texts are audio described also		

Sl. Nos. 27 to 29 are conforming to the 'Smithsonian Guidelines for Accessible Exhibition Design'

Emotional Accessibility			
Making Science Relevant and Inclusive			
30.	Successfully establishing relevance of science to everyday life and to the society		
31.	Maintaining a balance between relevance to non-traditional audience and the specialist		
Working with Schools as a part of socially inclusive practices			
32.	Supporting and subsidizing school trips as well as doing some outreach programmes at schools by supporting the curriculum		
33.	Focusing support and resources on schools from areas with large proportions of minority, ethnic and low income groups		
Lifelong Learning			
34.	Conducting training programmes on basic literacy and technical skills for different groups (Young, Women, Senior Citizens and marginalized groups like SC, ST, etc.)		
Outreach as social inclusion			
35.	Conduct outreach programmes (without any marketing agenda)		

Sl. Nos. 30 to 35 are conforming to the 'Open to All? Science Centres and Museums in the UK: Strategies for Social Inclusion' by Anwar Tlili of Centre for Informal Learning Schools, King's College, London

Economic Accessibility			
Programme for Groups with Special Needs			
36.	Conducting programmes targeting groups with special needs		
Programme for personal growth & community empowerment			
37.	Conducting programmes for personal growth & community empowerment		
Programme for Financial Inclusion			
38.	Conducting programmes for tackling the problem of unemployment		
39.	Provision of special benefits for the lower income groups or the underprivileged for entering the centre/museum		
Programmes for Tackling Crime			
40.	Conducting programmes for tackling crime		

Sl. Nos. 36 to 40 are conforming to the 'Museums and Social Inclusion The GLLAM Report' (Group for Large Local Authority Museums, October 2000), research undertaken by the Research Centre for Museums and Galleries (RCMG), Department of Museum Studies, University of Leicester.

NB: Each parameter has been assigned equal weight of 2.5, considering the fact that the total weight of all the forty (40) parameters of this study would be 100 (40x2.5=100).

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