

# Revised Norms/Guidelines for setting up of new Science Cities and Science Centres

## Science City

### **1. Background**

A committee was constituted for reviewing the existing norms for setting up Science Cities in the country which examined the issue from all angles and particularly from the standpoint of the long experience in running Science City, Kolkata. The committee finally concluded that a revised set of norms is necessary for setting up Science Cities in the country.

Accordingly, Ministry of Culture lays down the following revised norms for Science City Projects and their funding:-

### **2. Concept**

A Science City shall be conceptually similar to a Science Centre. However, it will be larger in dimension with a focus in frontier areas of Science and Technology and shall be financially self sustainable. It shall be conceptualised in such a manner that the visitors can spend long periods of time in it.

### **3. Main Objectives**

- i) To portray the growth of science and technology and their applications in industry and human welfare, with a view to develop scientific attitude and temper and to create, inculcate and sustain a general awareness amongst the people.
- ii) To popularize science and technology in cities, urban and rural areas for the benefit of students and for the common man by organizing exhibitions, seminars, popular lectures, science camps and various other programs.
- iii) To promote and enhance public understanding of the culture of science and technology.
- iv) To supplement science education given in schools and colleges and to organise various out-of-school educational activities to foster a spirit of scientific enquiry and creativity among the students.

- v) To design, develop and fabricate science museum exhibits, demonstration equipment and scientific teaching aids for science education and popularisation of science.
- vi) To organise training programmes for science teachers/students/young entrepreneurs/ technicians/physically challenged/housewives and others on specific subjects of science, technology and industry.

#### 4. Contents

The exhibits and activities of a Science City shall have the right mix of scientific values and novelty in presentation so as to be able to attract the common people from every walk of life . It will provide wide opportunities for visitors' participation in activities related to science and technology. It will be built on the following major areas :-

##### A) Face to face with science and technology

- A science exposition hall to provide an exposure to the frontline areas of science and technology and their impact on the society through interesting and enjoyable thematic presentation through interactive, experience based and immersive exhibits like large format films, 3D vision films, virtual reality experiences, simulators and many more hi-tech systems; Indian endeavor will be highlighted. An area may be earmarked to highlight the positive and negative impacts of S & T on the society at large.
- The exhibits shall be multidisciplinary in theme and of hands-on minds-on in nature to the extent possible showcasing frontier areas of S & T. The subjects will not be fixed for all times as they change over a period of time with emergence of new areas of S&T. However, at the present context, subjects like Nano-technology, Space mission, specific areas in Bio-technology, Photonics and Optical fibres, Computers, Earth Science, Human Body, Information technology, Bio-informatics, Heavy industries, Agriculture, Environment etc. may be considered.
- A dedicated infrastructure shall be provided for corporate bodies, R & D institutions, scientific departments etc. to showcase current status of technology and R & D in respective operational areas.
- A 600–1000 seat auditorium for multipurpose use viz. science education programmes and science film shows, organising educational, cultural, industrial/ corporate programmes; the capacity of the auditorium has been fixed on the basis of one million visitor turn out per year to the Science City.

Other institutions shall be encouraged to organise their programmes here on payment of rental charge which is to cover all expenses for regular running and operation of the auditorium including electricity charges, municipal tax etc. Although the State Governments shall be approached to provide electricity at concessional rates and ensure municipal tax at non-commercial rate, all taxes and royalties for conducting such programmes shall be borne by the organisers.

B) Experimentation and curriculum supplement

- Interactive exhibits explaining basic principles of science and technology in an interesting and entertaining manner.
- An open laboratory where the visitors will have the opportunities to conduct various experiments on different branches of science and technology either on their own or under guidance of the subject experts.

C) Learning science outside the four walls

- Sprawling science park will be developed to offer science education in an unconventional manner outside the four walls. Many of the outdoor exhibits will be linked with the indoor thematic presentations.

D) Visitors' recreational facilities

- This area will include water bodies, a nature trail, road trains, fountains, food plaza, gift and souvenir shops, restaurants, rest rooms and such other facilities which shall not only satisfy visitors' needs but also hold them for longer durations.

**5. Eligibility criteria and infrastructure**

- i) In view of demands from different quarters a few new Science cities may be developed in the country. The location of the Science City should be either a State capital or an important city of the State having a sizeable population of not less than 50 lakh inclusive of its vicinity.
- ii) While deciding location for a Science City the primary concern shall be to ensure that it can draw at least 10 lakh visitors per year.
- iii) The new Science Cities shall be set up preferably only in those places where no major Science Centre exists.

- iv) The State Government would provide the following infrastructure facility free of cost:
  - (a) at least 25 acres of centrally located and easily accessible fully developed land; although to do justice to all exhibits especially those requiring open spaces, 30 acres would be preferable;
  - (b) road connectivity, easy access,
  - (c) telecommunication facilities,
  - (d) power supply, water supply etc.
  - (e) sewerage and storm water drainage system,
  - (f) adequate public/private transport facilities.
  
- v) The State Governments and Societies / Authorities promoted by them for the purpose shall be eligible for financial assistance from the Central Government.

The State Government shall also make suitable provision for providing water, electricity, local taxes etc. at concessional rates as available to the educational institutions.

**6. Exhibition area**

*A. Floor area for indoor exhibitions*

|   |                     |
|---|---------------------|
| (a) Science Exposition Hall                       | - 10000 sqmt.       |
| (b) Open laboratory and interactive exhibits hall | - 2500 sqmt.        |
| (c) Entrance Plaza and visitor's facilities       | - 1500 sqmt.        |
|   | -----               |
|   | Total: 14,000 sqmt. |

*B. Outdoor expositions*

|                  |            |
|------------------|------------|
| (a) Science Park | 4000 sqmt. |
|------------------|------------|

While developing the permanent infrastructure care must be taken to maintain a ratio of 15:85 for covered and open areas so that the visitors are not confined in a particular place and there is enough space to accommodate a very large gathering on some days of the year.

Provision for future extension shall also be kept. A portion of the land area may be developed as commercial zone which shall be rented out to other agencies to support in raising funds to meet the operation costs of Science Cities.

## 7. Time Schedule

Total time required for implementation of a new Science City project shall be 48 months. In the first phase a portion of Science Exploration hall comprising a large format movie projection unit, a motion simulator and a 3-D vision theatre will be set up along with the entrance Plaza. This will help in immediate revenue generation and subsequent participation of corporate bodies.

## 8. Finance (based on 2005 prices)

Total estimated cost for implementation of a new Science City project is Rs. 50.00 crore. However detailed estimate for an individual project can only be prepared depending upon site condition, building design and local cost of construction. A suggestive break up of different items of expenditure is as follows:

| <u>Item</u>  | <u>Cost in<br/>Rs. Crore</u> | <u>Remarks</u>  |
|--|------------------------------|---|
| i) Expenditure on buildings and other works  |                              |   |
| (a) Cost of land   | 00.00                        | Notional. State Govt. shall provide it free of cost as part of its share for the project. |
| (b) Science City building 14,000 sq. mts.<br>with indoor exhibition halls(@ Rs. 13, 500/-<br>per sq.mt.) | 18.90                        |   |
| (c) Car/bus parking areas/internal roads/<br>landscaping/water body/boundary wall                        | 0.70                         |   |
| (d) Air-condition/insulation/acoustics   | 2.00                         |   |
| (e) Transformer (2 MW)/UPS/D.G. set  | 0.70                         |   |
| (f) Chairs/Carpet  | 0.20                         |   |
| (g) Planning, supervision and consultation fees  | <u>1.00</u>                  |   |
|  | Sub total :                  | 23.50   |
| ii. Expenditure on exhibits, equipment and stores  |                              |   |
| (a) Large format film projection unit with<br>accessories  | 6.00                         |   |
| b) Simulator / 3D Film Theatre   | 2.00                         |   |
| (c) Exhibits and artifacts   |                              |   |

|   |                |
|---|----------------|
| i) Thematic exhibits for Face to Face<br>with S&T   | 6.60           |
| ii) Interactive exhibits for<br>experimentation & curriculum<br>supplement                                    | 1.40           |
| (d) Projection equipment, audio-visuals,<br>electrical installations etc.                                     |                |
| i) Electrical installations for<br>Indoor and Outdoor Exhibit<br>Areas, Campus lighting,<br>Outdoor PA System | 2.00           |
| ii) AV and Projection equipment<br>for Auditorium   | 1.00           |
| iii) Computers, Plasma TV, Digital<br>projection equipment etc. for exhibits                                  | 3.00           |
| (e) Misc. equipment   |                |
| i) Apparatus and equipment for<br>open Laboratory   | 1.00           |
| ii) Workshop tools and machineries  | 0.50           |
| (f) Planning, design and development cost   | 1.00           |
| (g) Development of Science Park exhibits<br>including cost of exhibits  | 1.00           |
| (h) Capitalisation of labour component  | <u>1.00</u>    |
| Sub total :   | 26.50          |
| <b>Total</b>  | <b>: 50.00</b> |
| iii) Foreign Exchange component<br>included in Item (ii) above  |                |
| (a) Large format film projection unit with<br>accessories   | 6.00           |
| (b) Space Capsule (Simulator)   | 2.00           |
| (c) Misc. other equipments  | <u>0.50</u>    |

Sub total : 8.50

- iv) No foreign exchange is involved in bringing foreign experts or for buying foreign expertise.

The above estimate is for budgetary purpose only and detailed cost estimates for individual projects are to be worked out after detailed master plans are prepared for the projects.

## 9 Funding Pattern

- (i) The financial participation of the Central Government for new Science Cities will be limited to Rs. 30.00 Crore only (60% out of a total of Rs.50.00 Crore).
- (ii) The State Government shall arrange for the balance fund of Rs. 20.00 crore plus a 25 acre of land made available free of cost for the purpose of setting up the Science City. States contribution of Rs.20.00 crore may be raised either by themselves or by a private/corporate agencies or a combination of both.
- (iii) At the beginning of each year, the State Government shall provide their share for the year (part of Rs.20.00 Crore) upfront and the Central Government shall also release proportionate amount out of their share at one go (on a pro-rata basis for 60:40 sharing of Rs.50.00 crore).

### Year wise phasing of capital expenditure (Rs. in Crore)

| Source         | 1st Year    | 2 <sup>nd</sup> Year | 3 <sup>rd</sup> Year | 4 <sup>th</sup> Year | Total        |
|----------------|-------------|----------------------|----------------------|----------------------|--------------|
| Govt. of India | 3.00        | 9.00                 | 11.00                | 7.00                 | 30.00        |
| State Govt.    | 2.00        | 6.00                 | 6.00                 | 6.00                 | 20.00        |
| Total          | <b>5.00</b> | <b>15.00</b>         | <b>17.00</b>         | <b>13.00</b>         | <b>50.00</b> |

## 10. Management and operation

- i) The new Science Cities shall be made independent autonomous bodies run and managed by societies formed by the respective State Governments. NCSM be paid normal consultancy fees for technical guidance and consultancy in exhibit development and manpower training. These Societies are to be formed before start of execution of the projects so that they are able to receive monetary grants from both Central and State Govts. and the private/ corporate/industry sources as well as raise loans from financial institutions.
- ii) All Science Cities shall be maintained at the best possible way by generating enough funds by themselves to sustain all the operations. However capital grant for future developments may be raised from different sources. Corporate investments may be considered in two forms - either capital grant or if it is not forthcoming then through revenue support over the years against use of facilities and infrastructure.

## 11. Pre-requisites for approval of Ministry

- i) **Feasibility Report** : Detailed studies are to be conducted to ascertain the feasibility of any Science City project. The study shall carefully determine whether the proposed Science City shall have the ability to draw at least 10 lakh visitors annually and thereby have the prospect of being financially self supportive. The study shall be conducted by engaging professional consultancy service providers with active involvement of NCSM. Appropriate consultancy fees are to be paid to NCSM.
- ii) The Science City should have the provision for modular expansion at a later date, should the need arise.

## 12. Project implementation

The new Science City project shall be implemented by the concerned Societies formed by the respective State Governments. In case consultancy is sought from NCSM, the same will be limited to technical guidance and consultancy for design, development and installation of exhibits and also help in procurement and commissioning of equipment. Manpower training will also be a part of consultancy from NCSM.

## 13. Monitoring

Monitoring of Science Cities set up as individual Autonomous Societies shall be done by high level committees set up by the respective State Governments with due representation from the Government of India, the concerned State Government, their private/corporate partners (if any), NCSM and at least five eminent personalities in the fields of education, culture, S&T, industry and museology .

## Science Centres

### 1. Preamble:

A task force constituted by the Planning Commission in the early 1970's assessed the activities of the Science Museums and gave several recommendations on the course of action to be taken for the growth, sustenance and adequate use of these institutions. It brought to light the immense potentiality of the science museums for creating science awareness and scientific temper among the people.

The most important recommendations were to develop science museums/centres in 3 levels – National, Regional and District level and to set up science museums/centres in different parts of the country particularly to serve the rural populace.

During early 90's while setting up science centres in the north-eastern region, it was felt that although the north-eastern states were small in dimension, they had a distinct identity as a State. Therefore, naming the science centres in the northeast, as District Science Centres appeared to be out of place. Consequently these centres were designated as Sub-Regional Science Centres.

Currently there are several nomenclatures existing that categorise the science museums/centres. Such diverse nomenclature may confuse the State Governments or other agencies that are interested in setting up science centres. Therefore, it is proposed that in place of having diverse nomenclatures for the science centres, a single title namely "**SCIENCE CENTRE**" may be considered and the norms for setting up of the science centres may be derived based on the population of the place where the science centre is proposed to be set up.

Ministry of Culture lays down the following revised norms for Science Centre Projects and their funding:-

### 2. **Objectives**

The Science Centre will have primarily the following objectives:

- To portray the growth of science and technology and their application in industry and human welfare, with a view to develop scientific attitude and temper and to create, inculcate and sustain a general awareness amongst the people.
- To popularise science and technology for the benefit of students and for the common man of the region by organising exhibitions, seminars, popular lectures, science camps and various other programmes.

- To supplement science education given in schools and colleges and to organise various out-of-school educational activities to foster a spirit of scientific enquiry and creativity among the students.
- To design, develop and fabricate science museum exhibits, demonstration equipment and scientific teaching aids for science education and popularisation of science.
- To organise training programmes for science teachers/students/young entrepreneurs/ technicians/physically challenged/housewives and others on specific subjects of science, technology and industry.

### 3. **Concept**

A science centre provides an experiment based learning ambience to inculcate a spirit of inquiry, foster creative talent and create scientific temper in the community as a whole. It is characterised by its two-pronged channel of communication - exhibits and activities. While the exhibits, both indoor and outdoor, are mostly interactive, the demonstrations and training programmes are also fully participatory and help children and the adults alike to learn the basics of science through fun and enjoyment.

Science is best understood through experience and experimentation. Science Education, therefore, should essentially involve hands-on, experimentation based learning and should not remain within the domain of textbook reading. This is more important in India in view of widespread science illiteracy in the country. A Science Centre on the other hand provides scope of 'doing science' through hands-on facilities which offers to the visitor a number of experimental options through which they can discover the scientific concept themselves. Such mode of education has so far proved to be very effective in supplementing formal science education in our country.

### 4. **Physical and Financial Requirements**

#### **Category –I**

(A): *Science Centre located in a city / town with a population of 15 lakhs or more*

#### i) **Land:**

Minimum 7 acres developed land (preferably without any low-lying area and of fairly regular shape) to be provided by the State Government, free of cost.

ii) **Capital Expenditure:**

Rs.8.50 Crore of which the State Government will provide Rs.4.25 Crore and Government of India will provide an equal amount of matching grant against capital cost. The expenditure will cover construction of building, development of Science Park, fabrication and installation of exhibits, installation of and Taramandal, development of educational activities, development of Mobile Science Exhibition unit etc. The State Government shall arrange for the fund of Rs.4.25 crore plus a minimum of 7 acre plot of land made available free of cost for the purpose of setting up Regional Science Centre. State's contribution of Rs.4.25 crore may be raised either by themselves or by a private/corporate agencies or a combination of both.

iii) **Detailed break-up of the cost**

|  | (Rs. in Crore)           |
|--|--------------------------|
| Total cost of the project  | : 8.50                   |
| 1) <u>Building</u>   |                          |
| ▪ (Main building with a covered area of 4000 sq.mtrs.,<br>Civil construction including plumbing and sanitary)  | : 4.00                   |
| ▪ Electrical work including air-conditioning   | : 0.18                   |
| ▪ Lift and fire fighting   | : 0.16                   |
| ▪ Chairs for auditorium  | : 0.02                   |
| ▪ Architect fee  | <u>: 0.14</u>            |
|  | Total: 4.50              |
| 2) <u>Gallery Exhibits</u>   |                          |
| ▪ Three thematic galleries   | : 2.00                   |
| ▪ Science Park (approx. 11200 sq. mtrs. area with pathway and required<br>exhibits)                            | : 0.60                   |
| ▪ Inflatable dome planetarium system (Taramandal)  | : 0.05                   |
| ▪ Fully functional exhibit development lab   | : 0.10                   |
| ▪ Mobile Science Exhibition unit with bus and related exhibits:  | 0.40                     |
| ▪ Other facilities like Library, Conference Room, Stores, and Office etc.<br>with all required infrastructures | : 0.40                   |
| ▪ Training of the recruited staff members and other miscellaneous<br>expenses                                  | : 0.05                   |
| ▪ 3 D theatre facility   | <u>: 0.40</u>            |
|  | Total: <u>4.00</u>       |
|  | Grand Total: <u>8.50</u> |

iv) **Year wise phasing of capital expenditure**

(Rs. in Crore)

| Source         | 1st Year    | 2nd Year    | 3rd Year    | Total       |
|----------------|-------------|-------------|-------------|-------------|
| Govt. of India | 1.50        | 2.00        | 0.75        | 4.25        |
| State Govt.    | 1.50        | 2.00        | 0.75        | 4.25        |
| <b>Total</b>   | <b>3.00</b> | <b>4.00</b> | <b>1.50</b> | <b>8.50</b> |

v) **Recurring Expenditure:**

The recurring expenditure will be completely borne by the State Government. At present, the average annual recurring expenditure for a science centre is between Rs. 55.00 and Rs. 65.00 lakhs. Every year provision for the annual recurring expenditure for maintenance of the centre and organising year round activities shall be made by the State Government.

vi) **Operation:**

Science Centre will be operated and maintained by a Registered Society formed by the State Government for this purpose. The Society should be formed immediately after the release of the fund by the State Government towards its share of the capital cost of the project. A representative of the Government of India and National Council of Science Museums shall be an ex-officio member of this Society or its Governing Council.

The Society shall ensure that the Science Centre functions as per the requirement of its objectives without any deviations from them.

The Registered Society so formed by the State Government will complete the recruitment of the required 20 staff members as per the following schedule:

**vii) Schedule of Recruitment**

| Sl. No.                 | <i>To be recruited and posted within 3 months from the release of the fund by the State Govt.</i> |    | <i>To be recruited and posted within one year from the release of the fund by the State Govt.</i> |    |
|-------------------------|---|----|---|----|
| 01                      | Curator   | 02 | Assistant (General)   | 01 |
| 02                      | Education Assistant   | 02 | Upper Division Clerk  | 01 |
| 03                      | Technical Assistant   | 01 | Junior Steno  | 01 |
| 04                      | Technicians   | 08 | Lower Division Clerk  | 02 |
| 05                      | -   | -  | Drivers   | 02 |
|                         | Total   | 13 |   | 07 |
| <i>GRAND TOTAL - 20</i> |   |    |   |    |

NCSM will train the staff members recruited by the Society for the Centre.

**viii) Time Schedule:**

For a Science Centre, required time for setting up the centre is 33 months.

**ix) Content:**

The building will have a covered area of 4000 Sq. Mtrs. (approx.) of which 1800 Sq. Mtrs will be used as exhibit display halls, 1200 Sq. Mtrs. as visitors' activity area and remaining 1000 Sq. Mtrs as exhibit development laboratory, office etc. Scope will be provided for future extension of floor area.

Generally the following galleries and facilities will be set up in a Science Centre:

*Permanent Galleries:*

- Thematic Galleries: The Centre will have two thematic galleries. The galleries of the centre will be multidisciplinary in nature on themes of scientific importance as well as social relevance. The exhibits will be mostly interactive. These will be supplemented with visuals, illustrations and artefacts. The galleries will reflect all aspects of the chosen themes in a way easily comprehensible by students as well as common people.

- Fun Science: A group of interactive exhibits on Physical Science, Mathematics, Geography, Geology, Electronics, Life Science, Chemistry, Computer Science and Information Technology will form this gallery. The exhibits will be providing curriculum support to the students as well as make science learning a fun to the visitors

#### Temporary Exhibition Hall:

In this hall various temporary exhibitions on important themes will be organised periodically and on different occasions.

#### Outdoor Science Park:

Science brought outside the boundary of four walls. Interactive exhibits placed aesthetically in the lush greenery of the park. Children play with them while learns the fundamentals of science. Water body, Aviary, Animalorium, Herbal and Medicinal plant corner, Picnic area for visitors etc are added attractions.

#### Taramandal:

The inflatable dome planetarium can provide an excellent way of interactive learning of astronomy. The programme will be held regularly at the centre.

#### Educational and Training Programmes:

The centre will hold regular educational programmes like Science Demonstration Lecture, Popular lecture, Creative Ability Programme, Sky observation through telescopes, Computer awareness programmes, Science Quiz, Science Seminars and Science Fairs, Teachers' Training Programme, Community Awareness Programme, Anti-superstition Programme, Science Film Show etc. for students, teachers and common people. A training hall and a 150-seater auditorium will be used for these purposes.

There will be a Model School Science Centre where students will learn the basic principles of science through experimentation in science and fabrication of science models, which can be used as teaching aids. This will supplement the formal science education imparted in the schools. There will also be a children's activity corner.

Exhibit Development Lab:

This will be used for regular maintenance of exhibits and development of exhibits and kits in future. The Lab will be equipped with tools and machinery for fitting, carpentry, sheet metal, welding, electrical, electronics and painting works.

Mobile Science Exhibition:

The Mobile Science Exhibition (MSE) bus of the Centre will travel to schools situated in remote areas and will conduct exhibitions on relevant science and environmental topics throughout the year.

Other facilities:

Computer Training Room, Science Library, Conference Room, Office, Store etc.

x) **Programme Schedule:**

| Programme Schedule |                             | From the date of placing of order                |
|--------------------|-----------------------------|--|
| a                  | Construction of Building    | 24 months  |
| b                  | Development of Science Park | 12 months  |
| c                  | Fabrication of exhibits.    | 30 months  |
| d                  | Installation of exhibits    | 03 months (after completion of other facilities) |
| e                  | Opening of the centre       | 33months (approx)                                |

xi) **Fund Requirement:**

The capital cost of the Science Centre project will be Rs. 8.50 crore which will be shared on 50:50 basis between the State Government and the Govt. of India. The State Government will release their share of 50% (Rs. 4.25 crore) in full within 60 days after approval from Government of India is obtained for the project.

xii) **Clearance from the Government:**

For setting up the Science Centre, approval is required from Government of India. All other statutory clearances and approvals required by the local authorities of the State Government/other bodies etc. has to be obtained by the State Government.

## Category -II

(B): *Science Centre located in a city/ town with a population between 5 and 15 lakhs and for those located in hilly terrains and island territories*

i) **Land:**

Minimum 5.0 acres (preferably without any low-lying area and of fairly regular shape) of developed land to be provided by the State Government free of cost. For hilly areas, island territories etc. 2.5 acres will be acceptable provided the land is having good vicinity.

ii) **Capital Expenditure:**

The capital cost of the science centre will be normally **Rs.2.60 Crore**. However, for hilly terrains, island territories and remote areas with difficult access, the capital cost of science centre will be **Rs.3.00 crore**. The State Government shall arrange for the fund of Rs.1.30 crore (Rs. 1.5 crore for hilly terrains, Island territories and remote areas) plus a 5 acre plot of land made available free of cost for the purpose of setting up the Sub Regional Science Centre. State's contribution of Rs.1.30 crore or Rs.1.50 crore, as the case may be, raised either by themselves or by a private/corporate agency or a combination of both.

The capital expenditure will cover construction of building, development of Science Park, fabrication and installation of exhibits, installation of Taramandal, development of Educational activities etc.

iii) **Detailed break-up of the cost**

- Total cost of the project: Rs. 2.60 to 3 crore

*\* the cost may vary if the land is on a hilly terrain*

Building

|  |               |
|--|---------------|
| ▪ (main building with a covered area of 1024 sq.mtrs., Civil construction including plumbing and sanitary) | : 1.40        |
| ▪ Electrical work including air-conditioning   | : 0.10        |
| ▪ Chairs for auditorium  | : 0.01        |
| ▪ Architect fee  | : <u>0.04</u> |
|  | Total: 1.55   |

Gallery Exhibits

|   |        |
|---|--------|
| ▪ Two thematic galleries  | : 0.90 |
| ▪ Science Park<br>(approx. 5600 sq mtrs. area with pathway and required exhibits) | : 0.05 |
| ▪ Inflatable dome planetarium system (Taramandal)                                 | : 0.04 |
| ▪ Fully functional exhibit development lab  | : 0.04 |

- Other facilities like Library, Conference Room, Stores, and Office etc. with all required infrastructures. : 0.01
  - Training of the recruited staff members and other miscellaneous expenses : 0.01
- Total: 1.05  
Grand Total: 2.60

iv) **Year wise phasing of capital expenditure (Rs. in Crore)**

| Source         | 1st Year    | 2 <sup>nd</sup> Year | Total       |
|----------------|-------------|----------------------|-------------|
| Govt. of India | 1.00        | 0.30                 | 1.30        |
| State Govt.    | 1.00        | 0.30                 | 1.30        |
| Total          | <b>2.00</b> | <b>0.60</b>          | <b>2.60</b> |

v) **Recurring Expenditure:**

The recurring expenditure will be completely borne by the State Government. At present, the average annual recurring expenditure for a science centre is between Rs.25.00 and Rs. 30.00 lakhs. Every year provision for the annual recurring expenditure for maintenance of the centre and organising year round activities shall be made by the State Government.

vi) **Operation:**

The Science Centre will be operated and maintained by a Registered Society formed by the State Government for this purpose. The Society should be formed immediately after the release of the fund by the State Government towards its share of the capital cost of the project. A representative of the Government of India and National Council of Science Museums shall be an ex-officio member of this Society or its Governing Council.

The Society shall ensure that the Science Centre functions as per the requirement of its objectives without any deviations from them.

The Registered Society so formed by the State Government will complete the recruitment of the required 09 staff as per the following schedule:

vii) **Schedule of Recruitment:**

| Sl. No.                 | <i>To be recruited and posted within 3 months from the release of the fund by the State Govt.</i> |    | <i>To be recruited and posted within one year from the release of the fund by the State Govt.</i> |    |
|-------------------------|---|----|---|----|
| 01                      | Curator   | 01 | Lower Division Clerk  | 02 |
| 02                      | Education Assistant   | 01 | Drivers   | 01 |
| 04                      | Technicians   | 04 | -   | -  |
|                         | Total   | 06 |   | 03 |
| <b>GRAND TOTAL - 09</b> |   |    |   |    |

NCSM will train the staff members recruited by the Society for the Centre.

viii) **Time Schedule:**

For a Science Centre the required time for setting up the centre is 27 months (approx.)

ix) **Content:**

The building will have a covered area of 1024 Sq. Mtrs. (approx.) of which 512 Sq. Mtrs will be used as exhibit display halls, 216 Sq. Mtrs. as visitors' activity area and remaining 216 Sq. Mtrs as exhibit development laboratory, office etc. Generally the building is divided into 4 halls of equal area. Of this, 2 are used as exhibition halls, the 3rd contains an auditorium, Taramandal (Inflatable dome planetarium), Computer training hall etc. and the 4th is used as office, store, conference room/library and adult activity area.

Generally the following galleries and facilities will be installed in a Science Centre:

Permanent Galleries:

- Thematic Gallery: The main gallery of the centre will be on a theme of scientific importance as well as of social relevance such as Environment, Forest, Mountain, Natural Resources, Indigenous Technology highlighting the local resources and their apt utilisation. The exhibits will be mostly interactive and supplemented with visuals, illustrations and artefacts.

- Fun Science: A group of interactive exhibits on Physical Science, Mathematics, Geography, Geology, Electronics, Life Science, Chemistry, Computer Science and Information Technology will form this gallery. The exhibits will be providing curriculum support to the students as well as make science learning a fun to the visitors.

#### Outdoor Science Park:

Science brought outside the boundary of four walls. Interactive exhibits placed aesthetically in the lush greenery of the park. Children play with them while they learn the fundamentals of science. Water body, Aviary, Animalorium, Herbal and Medicinal plant corner, Picnic area for visitors etc are added attractions.

#### Taramandal:

The inflatable dome planetarium can provide an excellent way of interactive learning of astronomy. The programme will be held regularly at the centre.

#### Educational and Training Programmes:

The centre will hold regular Educational Programmes like Science Demonstration Lecture, Popular lecture, Creative Ability Programme, Sky observation through telescopes, Computer awareness programmes, Science Quiz, Science Seminars and Science Fairs, Teachers' Training Programme, Community Awareness Programme, Anti-superstition Programme, Science Film Show etc. for students, teachers and common people. A Training Hall and a 150-seat Auditorium will be used for these purposes.

There will be a Model School Science Centre where students will learn the basic principles of science through experimentation in science and fabrication of science models, which can be used as teaching aids. This will supplement the formal science education imparted in the schools. There will also be a Children's Activity Corner.

#### Exhibit Development Laboratory:

This will be used for regular maintenance of exhibits and development of exhibits and kits in future.

#### Other facilities:

Temporary exhibition hall, Science Library, Conference Room, Office, Store etc.

x) **Programme Schedule:**

| <b>Programme Schedule</b> |                             | <b>From the date of placing of order</b>         |
|---------------------------|-----------------------------|--|
| a                         | Construction of Building    | 18 months  |
| b                         | Development of Science Park | 12 months  |
| c                         | Fabrication of exhibits.    | 24months   |
| d                         | Installation of exhibits    | 03 months (after completion of other facilities) |
| e                         | Opening of the centre       | 27months (approx)                                |

xi) **Fund requirement:**

For the Science Centre normally the Capital Cost will be shared between the Govt. of India and the State Government on 50:50 basis. The State Government will release their share in full within 60 days after the commitment by the State Government is communicated for the project and after approval from Government of India is obtained for the project.

xii) **Clearance from the Government:**

For setting up the Science Centre, approval is required from Government of India. All statutory clearances and approvals required by the local authorities of the State Government/other bodies etc. has to be obtained by the State Government.

**Special Note:**

- 1. The land of the science centre shall be chosen in consultation and approval of NCSM*
- 2. The land earmarked for the science centre should be free from all encumbrances and encroachment. It should be fully developed land with electricity, water, sewerage connection and telecommunication facility available in the nearby vicinity. The land should have good road connectivity for easy access and transport.*
- 3. Apart from the core staff as indicated in the above proposal, other essential services may be outsourced.*
- 4. The science centre building will be developed in modular form to provide scope for future expansion, if need be, based on the growth of local population and visitor figures to the centre.*
- 5. For Science Centres located in hilly terrains, island territories, remote areas etc., the sharing of the capital cost may be considered on the basis of 90:10 between the Govt. of India and the respective State Government.*