# DEPARTMENT OF SCIENCE AND TECHNOLOGY
# GOVERNMENT OF KARNATAKA

# GUIDELINES FOR SETTING UP OF SUB-REGIONAL SCIENCE CENTRES

## SEPTEMBER 2014

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# Guidelines for setting up of Sub-Regional Science Centers in Karnataka

## 1. Preamble:

Science and Technology (S&T) are regarded as the most powerful instruments of growth and development for any country especially in the current scenario of emerging and competitive economy. Hence, S&T have become the engines of the socio-economic and cultural development in today's world, which have been profoundly influencing daily lives of common people. Development of S&T is particularly important in order to raise the standard of living, to eradicate blind belief & superstitions, create wealth as well as to ensure sustainable utilization of natural resources and conservation of biodiversity.

This underscores the importance of mainstreaming science, technology and innovation in all sectors of the economy, which will enable harnessing scientific advancements and technological innovations for the societal well being, particularly in the rural areas.

Therefore, it is necessary to spread scientific information, scientific awareness and spirit of scientific temper across the society to improve the living standards of rural people. Furthermore, scientific awareness can strengthen and empower the entire social fabric as well as help in achieving overall development of people in an increasingly competitive global market. Towards this, skills and knowledge in science and technology are learned and acquired in many different contexts, not only in formal settings like schools. The media, the workplace and museums of various kinds provide other learning contexts and science is best understood through experience and experimentation, which should essentially involve hands-on, experimentation based learning and should not remain within the domain of textbook reading.

Considering this, Ministry of Culture (MOC), GOI has established several regional and sub-regional/district science centers through National Council of Science Museum (NCSM), a subsidiary organization under MOC, GOI in different parts of the country.

These science centres are being established in district headquarters, which are either called regional science centres or sub-regional science centres. Regional Science Centers are larger in size, which are being established on an equal cost sharing basis between Govt. of India and the respective States. The revised cost for regional science centre is about Rs. 14.50 crores. While the sub-Regional Science Centers/district science centres also have same objectives as that of regional science centres, but they are of smaller in size. The revised cost for sub-regional science centre is about Rs. 5.00 crores.

Currently, Dept. of Science and Technology, GoK in association with the Ministry of Culture, GOI through National Council of Science Museum (an autonomous organization under the Ministry of Culture) is establishing regional science centres on an equal cost sharing basis in Dharwad, Mangalore and Mysore district headquarters. Dharwad regional science centre was established as a first regional science center in the state at an estimated cost of Rs. 10.50 crores, which was inaugurated and thrown open to public in February 2012. The second regional science centre has been established in association with Govt. of India at an estimated cost of Rs. 11.50 crores, which is ready for inauguration. Similarly, an action is being taken to establish one more regional science centre in Mysore at an estimated cost of Rs. 14.50 crores in collaboration with Govt. of India.

Besides this, from 2006 to 2010, it was also proposed to establish 10 sub-regional science centers in association with Ministry of Culture, Govt. of India through National Council for Science Museum (NCSM) in different districts of the State such as Raichur, Haveri, Tumkur, Hassan, Shimoga, Belgaum, Bellary, Uttara Kannada (Karwar), Kodugu (Madikeri) and Bidar. Accordingly, State Government had released Rs. 1.30 crores for each of these sub- regional science centres as its matching grant in accordance with the guidelines of NCSM, in anticipation of approval from Dept. of Culture, Govt. of India. However, Ministry of Culture, GOI has declined to support establishment of these centres and provide prorate share.

In view of the non approval of the Govt. of India, State Govt. is considering developing each of these centers with full funding support limiting to Rs. 4.00 crores per center. In addition, an action will also be taken to establish sub regional science centers in other district headquarters in a phased manner.

In view of this, DST, GoK has lays down the following guidelines for setting –up of sub-regional science centers/district science centres and their funding support broadly based on the guidelines of NCSM.

**2. Objectives:**

The overall objective of the Science Center is to promote science and technology developments for students and general public, eradicate superstitious beliefs and promote development of indigenous methodologies in a scientific way by providing activity based environment. The Science Centers will have 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 to create, inculcate and sustain awareness amongst the people.
- To popularize science and technology for the benefit of students and for the general public of the region by organizing exhibitions, seminars, popular lectures, science camps and various other programs.
- To supplement science education through hands-on- minds –on concept and through experimentation to foster a spirit of scientific enquiry and creativity among the students.
- To organize training programs for science teachers/students/young entrepreneurs/ technicians/physically challenged persons/housewives and others on specific subjects of science, technology and industry.
- To identify, encourage and nurture creative scientific talent especially among children and youth, through exhibits and models as well as to organize various outdoor educational activities.
- To disseminate information related to science and technology topics relevant to the State in particular and the Country in general.
- To eradicate superstitious beliefs in the society.

**3. Concept:**

The concept of science center is to foster and create interest in science and stimulate further enquiry far into an individual's life as well as to develop scientific attitude among general public. Science centres are indeed educational institutions, but they are not schools. These centres offer learning opportunities that are difficult to replicate in a traditional school settings. Science centres have been identified as an important resource in encouraging teenagers to choose higher education in science and technology. 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.

Further, science centre provides scope of 'doing science' through hands-on facilities. This mode of learning offers a number of experimental options to the visitors and students through which they can discover the scientific concept themselves and

provides very effective in supplementing formal science education. That apart, a science centre provides an experiment based learning ambience to inculcate a spirit of inquiry, foster creative talent and to develop scientific temper in the society as a whole.

It is characterized by its two-pronged channel of communication - exhibits and activities. While the exhibits, both indoor and outdoor, are mostly interactive, the demonstrations and training programs are also fully participatory and help children and the adults alike to learn the basics of science through fun and enjoyment.

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.

**4. Physical and Financial Requirements for Sub-Regional Science Centers:**

**i) Land**: Minimum 5.0 acres (preferably without any low-lying area and of fairly regular shape) of developed land (Road connectivity, Telecommunication facilities, Power and Water, Drainage, Adequate public /private transport) to be provided by the respective district authorities/universities, free of cost.

**ii) Capital Expenditure:** The capital fund needed for setting up of sub-regional science center is Rs. 4.00 crores. 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.

The detailed break-up of the cost is given below:

| Sl. No. | Item | Approx.Cost (Rs.in lakhs) |
|---|---|---|
| 1 | Main Building with a covered area of 1000 sq.mtrs., Civil construction including plumbing and sanitary, electrical work including air-conditioning | 180.00 |
| 2 | Chairs for Auditorium | 10.00 |
| 3 | Architect & Project Monitoring Fee | 9.00 |
| 4 | Two Thematic Galleries & other facilities | 90.00 |
| 5 | Out-Door Science park (approx. 5600 sq. m. area with pathway and required exhibits) | 36.00 |
| 6 | Taramandal (Inflatable-Dome Planetarium System) | 05.00 |
| 7 | Other facilities like library, Conference rooms, stores and office etc., with all required infrastructures | 10.00 |
| 8 | Generator & Miscellaneous expenses | 10.00 |
| 9 | Development of land | 50.00 |

| | |
|---|---|
| **Total** | **400.00** |

**iii) Recurring Expenditure:**

The recurring expenditure will be completely borne by the Dept. of Science and Technology, GoK. At present, the average annual recurring expenditure for a science centre is Rs. 40 lakhs. This amount shall have to be utilised for maintenance of staff, administrative activities as well as to organise year round scientific activities aiming at inculcating scientific spirit and temper for students and general public.

**iv) Operation:**

1 The Science Centre will be operated and maintained by a Registered Society formed by the respective District Authorities/Universities with the Chairmanship of Deputy Commissioner/Vice Chancellor, depending who has contributed the land. A registered society will run and maintain the center after development and handed over by KSTePS, an autonomous organization under DST, GoK. A representative of the KSTePS shall be an ex-officio member of this Society.

2 General guidelines outlining composition of General Body, Executive Committee and Administrative Structure are highlighted in the enclosed Memorandum of Association and Rules and Regulations, which may be followed by all the concerned authority to bring uniformity amongst the science centres in the state.

**v) A typical composition of the society shall be as follows:**

**I. Governing Body**

| | | |
|---|---|---|
| I. | Chief patron | : Hon'ble Minister for Science and Technology |
| II. | Chairman | : Principal Secretary/Secretary to Government<br>Dept. of IT, BT and S&T, GoK |
| III. | Member | : Principal Secretary/Secretary to Govt., Finance (B&R) |
| IV. | Member | : Principal Secretary/Secretary to Govt.,<br>Primary & Secondary Education |
| V. | Member | : Principal Secretary/Secretary to Govt., Higher Education |
| VI. | Members | : EC Chairmen and Member Secretaries of all the<br>Science Centres |
| VII. | Members (3) | : Prominent Scientists/ Engineers |
| VIII. | Member Secretary | : MD, KSTePS |

**I I. Executive Committee**

1. Chairman : Respective District Deputy Commissioner or VC (Depending on the place of establishment and land provided by the authority)
2. Vice-Chairman : Respective District CEO, Zilla Panchayat or Registrar (Depending on the place of establishment and land provided by the authority)
3. Members (3) : Prominent Scientists/ Science Promoters
4. Members (2) : Line Dept. Officers
5. Member : MD, KSTePS or his representative
6. Member Secretary: To be appointed on Deputation in the cadre of Dy. Director or Associate Professor (Depending on the place of establishment and land provided by the authority)

1. The Member Secretary for the center shall be appointed on deputation either from Education Department or Universities, who is in service and must own accountability in the system.
2. The appointed Member Secretary shall be designated as Director of the center with full autonomy in the financial and administration powers.

**Note: A typical guidelines for constitution of registered society as per Societies registration Act 1960 is given in Annexure-1**

The society shall ensure that the science centre functions as the requirement of its objectives without any deviations from them. The Registred Society so formed by the District Administration or University will complete the recruitment of the required 09 staff as per following schedule:

**vi) Schedule of Recruitment:**

The Registered Society so formed by the District Authority in consultation with DST, GoK will complete the recruitment of the required 09 staff members as per the following schedule:

| Sl.No. | Staff | Number | Recruitment |
|---|---|---|---|
| 1 | Curator | 01 | To be recruited and posted within two years of sanction of the science center. |
| 2 | Education Assistant | 02 | |
| 3 | Technical Assistants | 01 | |

| | | | |
|---|---|---|---|
| 3 | Technicians | 02 | To be recruited as per the requirement on contract basis. |
| 4 | Lower Division Clerk | 02 | To be recruited as per the requirement on contract basis. |
| | **Total** | **08** | |

KSTePS will help to provide training for the staff members recruited by the Society through NCSM or other specialized agencies.

**vii) Content:**

The building will have extent area of 1000 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), and 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 Sub-Regional Science Centre:

- ✓ **Thematic Gallery:**

  The main gallery of the centre will be on a theme based scientific topic as well as of social relevance such as Environment, Natural Resources, Indigenous Technology highlighting the local resources and their apt utilization. The exhibits will be mostly interactive and supplemented with visuals, illustrations and artifacts.

- ✓ **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.

- ✓ **Information Age:**

  This gallery will depict the basic concepts of computers and their applications in industry, education, communication, scientific research and management of daily life etc.

- ✓ **Taramandal-Inflatable Dome Planetarium:**

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

- ✓ **Seminar Hall for Educational and Training Programs:**

  The centre will hold regular educational programs like science lecture, popular lecture, and creative ability program, sky observation through telescopes, computer awareness program, science quiz, science seminars and science fairs, teachers training program, community awareness program, anti-superstition program, 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 building 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.

- ✓ **Science Library:**

  It is essential to maintain a library consisting of books on basics of science, development of science and technology, science fiction, journals, etc., to develop scientific temper among the children, youth and general public.

- ✓ **Computer room with internet facilities:**

  Computers have made their presence in every corner of the country. Information is the basic requirement of any science promotion program. In spite of these, internet facilities are inaccessible even in many of the towns and villages. Providing necessary infrastructure at the sub-divisional level would enable students, teachers, and general public to get a feel of cyber world and to make use of the cutting edge technologies to widen the horizon of their knowledge.

- ✓ **Exhibits of various scientific and technological based products:**

  Necessary infrastructure will be provided to create an opportunity to the school children and college students at separate platforms to display their science/technological models. General public will also take part by demonstrating

the talents inherited by them from their ancestors which are science based and are applicable even today.

- ✓ **Outdoor Science Park:**

  Science is brought outside the boundary of four walls. Interactive exhibits will be placed aesthetically in the lush greenery of the park and 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.

- ✓ **Other Activities:**

  Since science is best understood through experience and experimentation, a number of activities like science fair, science seminar, science quiz, science drama and science exhibition will create a perpetual awe and love for science.

**viii) Program Schedule:**

| **Program Schedule** | | **From the date of placing of order** |
|---|---|---|
| a | Construction of Building | 24 months |
| b | Development of Science Park | 06 months |
| c | Fabrication of exhibits | 24 months |
| d | Installation of exhibits | 06 months (after completion of other facilities) |
| e | Opening of the centre | 30 months (approx.) |

**ix) Approval from the Government**

All statutory clearances and approvals required by the local authorities of the State Government/other bodies etc. has to be obtained by the respective societies.

**5. Recommendations:**

1. The land for the sub-regional science centre shall be chosen in consultation and approval of KSTePS.
2. The land earmarked for the science centre should be free from all encumbrances and encroachment. The land should have good road connectivity for easy access and with close proximity to the city.
3. Other essential services such as housekeeping, operation and maintenance staff may be outsourced.

4. The science centre building may be developed in modular form to provide scope for future expansion, if need be, based on the growth of local population and visitors to the centre.
5. Networking of all the sub-regional science centers functioning in the State will be undertaken to optimally share resources, experiences and expertise under the aegis of KSTePS.

6. A common architectural plan will be worked out through an expert architect as many of the components of the science centers are in similar nature, but for the thematic gallery.

7. The common architectural plan shall be optimised for the respective district science centres looking at the selection of thematic gallery, terrain condition, weather and cultural & historical relevance of the region.

8. Based on the architectural design, building construction/civil works shall be tendered together for all the centres through KSTePS.

9. The construction/ civil works of the science centers shall be entrusted through KSTePS either to IISc or NITK experts to ensure quality of construction.

10. Exhibits/models both indoor and outdoor shall be procured through KSTePS for all the centers, which are yet to procure in order to ensure reduction in the cost through bulk purchase. The models could be procured either from NCSM or other agencies, wherever the models are available for best price with better quality. While purchasing from the private parties, due procedures have to be followed as per the KTPP act.

11. Efforts shall be made to obtain the models/exhibits from Govt. of India organizations such as ISRO, DAE, DRDO, HAL, BEL and BEML as well as from private companies and international agencies.

12. The Member Secretary for the centre shall be appointed on deputation either from Education Department or Universities, who is in service and must own accountability in the system.

13. The appointed Member Secretary shall be designated as Director of the centre with full autonomy in the administration.

14. The sub-regional science centers shall not be equated with KRVP district science centers as there are confusions in the present set-up (either they shall be winded up or ask them maintain as a separate identity).

15. All science centers shall be formed as a registered society and not as a trust.

16. Sub-Regional Science Centre/District Science Centres shall function as units of KSTePS, DST, GoK and support all activities/programs directed from time to time.

17. Employees from one science centre to another centre will be transferred, whenever it is found desired by KSTePS in order to enhance efficiency of the working of science centres.

18. Science Centers are encouraged to add new and innovative facilities besides the galleries and facilities through local funding support.

19. State Government may consider developing a state-of-the-art workshop for development of cost effective innovative models and supply them to district Science Centers at regular intervals. The Knowledge Resource Center for S&T being established at JSSMVP in Suttur, Nanjanagud Taluk, Mysore District may be considered for establishment of the proposed workshop for development of models.

20. A provision shall be made to transfer employees from one centre to another centre, whenever it is required in order to enhance efficiency of the working of science centres.