

**BUILDING MATERIALS & TECHNOLOGY  
PROMOTION COUNCIL  
(BMTPC)**

**OUTCOME BUDGET 2015-2016**

**Chapter – I**

The Building Materials & Technology Promotion Council (BMTPC), registered as Society in 1990, is an organisation fully supported by the Ministry of Housing & Urban Poverty Alleviation, Govt. of India with the objective of bridging gap between the laboratory development and large scale field application of cost effective, sustainable building materials and housing technologies including disaster resistant construction practices. In order to realise its objectives, BMTPC initiated several multi-faceted activities enshrined in the mandate of the Council so as to create enabling environment for sustainable building construction. Over the years, the Council has been striving for the successful transfer of the innovative, cost-effective, environment-friendly and energy-efficient alternate building materials and technologies at grass-root level. The Council has also embarked upon the field level application of these materials and technologies through demonstration construction of model demonstration housing and other structures such as informal markets, community centre, etc. in different parts of India. In its technology development, promotion and dissemination efforts, the Council developed various technologies for use in housing and building construction including bamboo based housing solutions. The Council also constructed demonstration structures in the North Eastern Region and helped in setting up Bamboo Mat Production Centres to make available the bamboo mats for the production of bamboo mat related products such as corrugated sheets, bamboo boards, etc. leading to employment generation. BMTPC is actively involved in disaster mitigation activities and working in close liaison with NDMA, NIDM and other related institutions. Apart from bringing out the first ever Vulnerability Atlas of India in 1997 and 2006, the Council regularly publishes valuable guidelines/manuals on disaster resistant construction. In order to create awareness regarding seismic retrofitting, the Council has undertaken retrofitting of few buildings. The Council has also been designated as one of the Appraisal and Monitoring Agencies for Projects under Rajiv Awas Yojana (RAY) and Jawaharlal Nehru National Urban Renewal Mission (JNNURM) of Ministry of HUPA. The Council in recent years has reoriented its approach towards promotion of not only sustainable technologies through intensive evaluation, dissemination but also propagating emerging prefabricated housing technologies from within the country and abroad for social mass housing. The role of the Council is reflected in the following objectives:

- ***Building Materials & Construction Technologies:*** To promote development, standardization, mechanization and large scale field application of proven innovative and emerging building materials and technologies in the construction sector.
- ***Capacity Building and Skill Development:*** To work as a Training Resource Centre for capacity building and promotion of good construction practices to professionals, construction agencies, artisans and marketing of building technologies from lab to land.
- ***Disaster Mitigation & Management :*** To promote methodologies and technologies for natural disaster mitigation, vulnerability & risk reduction and retrofitting/ reconstruction of buildings and disaster resistant planning for human settlements.

- ***Project Management & Consultancy:*** To undertake project management and consultancy services including appraisal, monitoring and third party inspection of housing projects under the various Central/State Schemes.

#### **Functions of BMTPC:**

- Identification, evaluation of innovative and emerging technologies available globally and encouraging joint venture in building materials and construction sector.
- Promoting economy, efficiency and quality in construction.
- Upscaling of technologies, know-how acquisition, absorption and dissemination.
- Field level application of environment-friendly, energy-efficient and disaster resistant technologies for innovative, locally available and emerging technologies.
- Formulation of Standards on innovative building materials/technologies including emerging technologies/systems and incorporation in the schedule of specifications/rates.
- Formulation of Standards/Specifications for Affordable Housing
- Documentation of benefits, durability and acceptability of cost effective and innovative building materials and technologies.
- Skill upgradation of professionals and construction workers through capacity building programmes, training programmes, seminars, conferences, workshops, exhibitions nationally as well as internationally.
- Promoting disaster resistant construction technologies.
- Appraisal, monitoring and third party inspection of housing projects including undertaking project management and consultancy services.
- Publication of user manuals, guidelines, compendiums, directories, brochures, techno-feasibility reports, video films, demonstration CDs, interactive website, blogs including documentation of success stories.

## Chapter – II

Sr. No	Name of Scheme/ Programmes	Objective/ Outcome	Outlay 2015-16 (in Rs. Crore)			Quantifiable Deliverables / Physical Outputs	Projected Outcomes	Processes/ Timeliness	Remarks/ Risk Factors
			4						
			4(i) Non-Plan Budget	4(ii) Plan Budget	4(iii) Complementary Extra-Budgetary Resources				
1.	Building Materials & Technology Promotion Council	<ul style="list-style-type: none"> <li>▪ <u>Building Materials &amp; Construction Technologies:</u> To promote development, standardization, mechanization and large scale field application of proven innovative and emerging building materials and technologies in the construction sector.</li> <li>▪ <u>Capacity Building and Skill Development:</u> To work as a Training Resource Centre for capacity building and promotion of good construction practices to professionals, construction agencies, artisans and marketing</li> </ul>		Rs.11.50 crores		<ul style="list-style-type: none"> <li>• Identification, evaluation and promotion of proven &amp; emerging housing technologies</li> <li>• Introduction of emerging technologies in work specification of State</li> <li>• Establishment of Building Technology Park in Delhi</li> <li>• Creation and maintenance of portal/database/directory on emerging technologies, products, process and providers</li> <li>• Construction of demonstration structures using proven and emerging technologies for creating confidence amongst the users</li> <li>• Preparation and updation</li> </ul>	<ul style="list-style-type: none"> <li>• Availability of different proven and emerging technologies for construction of houses with speed and quality at affordable cost.</li> <li>• Saving in high energy conserving materials</li> <li>• Employment Generation</li> <li>• Capacity building and skill upgradation</li> <li>• Mechanisation of production of precast elements</li> <li>• Improvement in quality and quantity of products</li> <li>• Forest conservation</li> <li>• Utilisation of agro-industrial wastes</li> <li>• Bamboo as construction material</li> <li>• Creating awareness about the disaster</li> </ul>	March, 2015	<ul style="list-style-type: none"> <li>• Quality in form of output with respect to its usability.</li> <li>• Circumstantial delay in research processes.</li> <li>• Non Availability of free land for the projects from the States.</li> <li>• Lack of sensitivity among stakeholders.</li> <li>• Circumstan</li> </ul>

		<p>of building technologies from lab to land.</p> <ul style="list-style-type: none"> <li>▪ <u>Disaster Mitigation &amp; Management</u> : To promote methodologies and technologies for natural disaster mitigation, vulnerability &amp; risk reduction and retrofitting/reconstruction of buildings and disaster resistant planning for human settlements.</li> <li>▪ <u>Project Management &amp; Consultancy</u>: To undertake project management and consultancy services including appraisal, monitoring and third party inspection of housing projects under the various Central/State Schemes.</li> </ul>			<p>of Schedules of Specifications, code of practices, analysis of rates, labour output data, energy audit</p> <ul style="list-style-type: none"> <li>• R&amp;D Projects in the field of housing and building construction</li> <li>• Implementation of Performance Appraisal and Certification Scheme (PACS)</li> <li>• Dissemination of information through print &amp; electronic media including website upkeep</li> <li>• Organisation and participation in Seminars, Exhibitions for promotion of proven and emerging building materials &amp; technologies</li> <li>• Organisation of Skill Development Programmes for construction workers</li> <li>• Organisation of capacity building programmes for professionals indifferent region</li> <li>• Use of Bamboo in housing and Building Construction and organisation of Training Programmes on Bamboo based technologies in North Eastern States</li> </ul>	<p>resistant technologies</p> <ul style="list-style-type: none"> <li>• Vulnerability reduction by adopting disaster resistant technologies</li> <li>• Reduction in economic &amp; human losses</li> <li>• Proper disaster management &amp; Preparedness</li> <li>• Effective and value addition utilisation of natural resources</li> <li>• Promote sustainable habitat design practices.</li> <li>• Energy and resource conservation through reduced energy and material expenditures, waste disposal costs, and utility bills</li> <li>• Improve the comfort, health and well-being of building occupants and public visitors;</li> <li>• Sustainable design and construction practices resulting in investments.</li> </ul>	<p>tial delay due to harsh geo-climatic conditions.</p>
--	--	--	--	--	--	--	---

						<ul style="list-style-type: none"> <li>• Retrofitting of school building in Delhi</li> <li>• Implementation of Techno-Legal Regime in various States/UT's in India - NDMA</li> <li>• Preparation of updated Earthquake Hazard Maps and Atlases for NDMA</li> <li>• Organization of Training of Trainer Programmes for engineers and architects of Bihar Govt. through BIPARD</li> <li>• Organisation of Training Programmes on Disaster Resistant Technologies</li> <li>• Appraisal of DPR's, monitoring &amp; TPIM review of projects, capacity building of functionaries of state local bodies and monitoring of projects under RAY and 10% lump sum provision for NE Region.</li> </ul>		
--	--	--	--	--	--	--	--	--

### **Chapter – III**

BMTPC has initiated the following measures for strengthening its intermediate outputs:

- Reoriented its approach towards promotion of not only sustainable technologies through intensive evaluation, dissemination but also looking at emerging prefabricated housing technologies from within the country and abroad for social mass housing.
- Implementation of modified Byelaws, Recruitment-cum-Promotion Rules and Delegation of Power.
- Internal Committee for smooth and harmonious functioning of the Council:
  - Construction Committee
  - Investment Committee
  - Advertisement Committee
  - Printing Committee
  - Local Purchase Committee
  - Store Purchase Committee
  - Transport Committee
  - Contractual Payment Committee
- The Council has implemented the Result-Framework document (RFD)
- To redress citizen grievances, online handling of the public grievances through centralized public grievances redress and monitoring system has been initiated.
- Nominated an officer as the Director of grievances and an officer as Welfare Officer for smooth functioning of the organization and to find out the solution of the grievances of the staff members.
- SCs & STs Cell for welfare and development of Scheduled Casts & Scheduled Tribes
- Implementation of RTI Act, 2005
- Committee for Prevention of Sexual Harassment of women at workplace.
- Independent audit of implementation of Citizen's Charter.
- Independent audit of implementation of public grievance redressal system.

### **Chapter – IV**

#### **Review of Past Performance**

During the years 2013-14 and 2014-15 (up to December, 2014), the Council has undertaken the following major activities:

#### **Performance during 2013-14**

1. In order to demonstrate cost effective, alternate and disaster resistant technologies, the Council completed Demonstration Houses at Barwaripur, Rae Bareli using alternate technologies at the land provided by the local administration. In this Project, construction of 24 dwelling units (G+1) alongwith onsite infrastructure development were undertaken having each unit with plinth area of 32 sqm consisting of one living room, one bedroom, kitchen, one separate bath and WC with infrastructure facilities. The Demonstration Housing Project also includes onsite infrastructure facilities like internal water supply, sanitation, electrical, pathways, bio-digester, underground tank, street lighting, etc. The Demonstration Housing Project was handed over to the local administration in February 2014.

2. To display the cost effective, alternate and disaster resistant technologies for general public, BMTPC constructed a demonstration house during the BMTPC Display at HUDCO BuidTech 2013 during India International Trade Fair at Pragati Maidan from 14-27 November, 2013. The Demonstration Unit having plinth area of 33.15 sqm. consisted of two habitable rooms, kitchen, Combined Bath & Toilet and Front and Rear Court Yard with various cost effective and alternate technologies such as Rat-Trap Bond in Flyash Bricks, Cellular Light-weight Concrete Blocks, Hollow Concrete Blocks, Fly Ash Interlocking Blocks, RB slab with Bricks, Filler slab with earthen Pots and Bricks, MCR Tile Roofing, Precast RC Planks and Joists, Bamboo Mat Corrugated Roofing Sheets, Bamboo mat door, Ferro cement Shelves, Sunshades, Kitchen Slab, etc. as well as Earthquake/Cyclone Resistant features.

3. In order to give impetus to emerging technologies for social mass housing, BMTPC has been putting definitive strides and earlier invited Global Expression of Interest (EOI) for introducing emerging and alternate cost effective housing technologies suitable to Indian geo-climatic and hazard conditions. Technology Advisory Group (TAG) was constituted to help in studying the suitability of emerging technologies for mass scale housing in Indian conditions. Based on the technical details made available, demonstration construction and other aspects, the following four emerging technologies have been approved by TAG in its meeting held on 23.10.2013:

- 3S Prefabricated System
- Monolithic construction technology using Aluminium Formwork
- Monolithic construction technology using Plastic Formwork
- EPS Sandwiched Panel system (Italy)

The technology profiles of the above technologies have also been prepared. All the details regarding the approved technologies has been forwarded to State Governments and their related Departments through the Ministry of Housing & Urban Poverty Alleviation with a letter that these are technologies which have potential and can be used for mass housing.

4. Under the Performance Appraisal Certification Scheme (PACS) of the Council various applications were processed and the meeting of the Technical Assessment Committee (TAC) for PACS was held on 22nd November, 2013 wherein following 4 new products/systems have been approved for issue of PACs:

- EPS Sandwiched Panel System - EMMEDUE Advanced Building System (Italy)
- Factory made Fast Track Modular Building System (Instacon)
- Fluorogypsum Anhydrite based Binder
- Polystyrene based Insulation Tiles – Kooltile

TAC in the said meeting also approved the renewal of PACs for 5 products/systems namely Continuous Sandwich Panel, Marshal Door, FRP Manhole, Polyethylene Underground Septic Tank and Glass Fibre Reinforced Gypsum Building (Rapid wall) System. Further, 5 more applications for the following systems/machinery have been received for issue of PAC:

- Speed Floor System using steel
- Light Gauge Steel Structure with EPS Panel/Cement Particle Board
- EPS Sandwiched Panel system (China)
- Tunnel Forms (Formwork/Shuttering)
- Concrete Block making Machine

5. To sensitize about the emerging technologies at the State level, the Council organized a Workshop at Gandhinagar on August 31, 2013 with Ahmedabad Municipal Corporation wherein approximately 400 professionals from various departments of State Government participated in the Workshop. During the workshop interactions were also held with Gujarat State officials jointly with the technology providers. The Council also joined hands with APREDA and conducted a session on emerging technologies at Hyderabad on 25<sup>th</sup> October, 2013. A Workshop on Emerging Building Materials & Construction Technologies was organized on 7 March 2014 at Bangalore jointly with Karnataka Slum Development Board.

6. The Council has initiated a process for inclusion of already evaluated emerging technologies in the CPWD Schedule of Rates (SOR). In this direction, presentations from the Technology Providers of Monolithic Concrete Construction using Aluminium/Plastic formwork was organized on September 20, 2013 and GFRG Panel system on October 18, 2013 before the senior engineers and architects of CPWD. CPWD desired that BMTPC may first formulate SOR on the technology and submit the same for their consideration. BMTPC has already initiated the process for preparation of SOR jointly with Indian Building Congress, IIT Chennai and SEP Ahmedabad. The SOR for GFRG technology has been prepared and are under circulation to the various stakeholders for comments.

7. The Council organized a Brain Storming Session for identification of possible areas of cooperation on alternate and emerging housing technologies with R&D Institutions on 12<sup>th</sup> June, 2013 at New Delhi. Representatives from academic institutions, CSIR labs and other institutions participated in the Brain Storming Session. Further, two brain storming sessions on Utilisation of Marble Slurry in Housing and Building Construction were organised at Chittorgarh and Udaipur on 24 & 25 February, 2014.

8. As the outcome of the Brain Storming Session at New Delhi, the Council received a number of R&D project proposals. In order to guide BMTPC in identification and selection of R&D projects in the field of housing and building construction, to evaluate & recommend the project proposals received and periodic monitoring of the projects, a Committee of Experts was constituted by the Chairman, Executive Committee of BMTPC. Two meetings of the Committee were held. On the recommendation of the Committee, following two projects have been selected and initiated:

- Precast concrete column for low cost housing
- Development of HuMotor – A Human Way to Utilise Human Efforts

9. With regard to formulation of Standards/ Specifications for Affordable Housing for different regions, various details have been worked out. Under this, Design Templates are being developed for various regions which will include design of single house and cluster of houses with optimum number of dwelling units for EWS and LIG categories. While designing, vernacular style of architecture suiting geo climatic conditions and disaster resilient planning and construction are being kept in mind. This would help in standardize space and size of various elements and components. Few agencies and institutions were involved to develop specifications on zonal basis. The draft for the western zone has been prepared.

10. Based on the draft for western region, a Consultation Meet on Standards & Specifications for Affordable Housing was organised on 26 March 2014 at Ahmedabad for

advocacy to the state Govts. and wider consultation with stakeholders. The officials from Maharashtra, Madhya Pradesh, Rajasthan and Gujarat participated in the Consultation Meet.

11. BMTPC participated in HUDCO BuildTech 2013 and put up exhibition on Alternate and Emerging Building Materials and Construction Systems by hiring a space of 271 sqft. during India International Trade Fair from 14-27 November, 2013 at Pragati Maidan, New Delhi. BMTPC exhibition included participation by thirteen technology providers/ companies in the area of emerging housing technologies by putting up the display within the BMTPC area. These companies displayed various details of products and plant and machineries for light weight synthetic aggregates, Fly ash based building products, fast and pre-fabricated housing technologies, alternative in cements & water proofing materials, stabilized mud & cement based housing technology and environment friendly bio-digester. Having wide range of products and housing technologies for individual houses to mass housing solutions, the exhibitions attracted large number of visitors.

12. In order to create awareness and disseminate the benefits of the Performance Appraisal Certification Scheme amongst manufacturers/ developers/ suppliers of new building materials and construction system, BMTPC organized a National Seminar on PACS on 23<sup>rd</sup> August, 2013 at New Delhi. The then Minister of Housing & Urban Poverty Alleviation inaugurated the Seminar and gave a key note address emphasizing the use of local materials and emerging technologies and pointed out that in Rajasthan, marble slurry waste is available in abundance and efforts may be made to use such local materials so as to reduce the material and transportation costs which will be comparatively less as compared to the materials brought from other places. On the occasion, two publications of BMTPC namely “Performance Appraisal Certification Scheme - A Tool to Propagate Innovative and New Building Materials & Technologies” and ‘Major Activities in Pursuit’ were released by the Chief Guest. About 40 participants from different fields and various Govt. Organizations, Institutions, reputed private companies, architects and consultants etc. participated in the Seminar.

13. The Council has been assigned a Project on “Rejuvenation and Strengthening of the National Network of Building Centres – Pilot Studies” by HUDCO under HUDCO CSR funding. The Ministry of Housing & Urban Poverty Alleviation made concerted efforts to revive the Building Centres and a Committee was set up by HUDCO in consultation with Ministry to look into problems, prospects and proposal for revival. After detailed discussions with HUDCO, 16 projects have been initiated. For rest of the projects, HUDCO has been requested to facilitate BMTPC for submission of projects by various Building Centre selected by the Committee set up by HUDCO.

13. As a part of the World Habitat Day Celebrations 2013, BMTPC organised Painting Competition for Differently Abled Children on the theme “Urban Mobility” in the categories viz. Mentally Challenged, Hearing Impaired and Visually Impaired. The winners were facilitated during the World Habitat Day Celebration Function in New Delhi on 7<sup>th</sup> October, 2013. The publications which were also brought out to mark the occasion are (i) Special Issue of Newsletter “Nirman Sarika”, (ii) Propagation of Cost Effective and Disaster Resistant Technologies through Demonstration Construction, (iii) Disaster Mitigation and Management – Initiatives by BMTPC, and (iv) Methodology for Documenting Seismic Safety of Housing Typologies in India.

14. The Council has brought out a publication titled “Criteria for Production Control of Ready Mix Concrete for RMC Capability Certification under Ready Mix Concrete (RMC) Plant Certification Scheme (QCI)”. The publication has been prepared with wide consultation of members of Technical Committee representing user agencies like CPWD, Airport Authority of India, Ministry of Road Transport & Highway, DMRC & National Highway Authority of India; R&D labs like NCCBM, CBRI; other experts and the industry represented by RMCMA; has formed the basis of auditing of plants for the Certification Scheme by Quality Council of India.

15. In order to create awareness about the gainful utilization of marble waste in housing and building construction and to identify further areas of research, BMTPC organized two Brain Storming Sessions on Utilization of Marble waste in Housing and Building Construction on 24<sup>th</sup> and 25<sup>th</sup> January, 2014 at Chittorgarh and Udaipur respectively. The Brain Storming Session at Chittorgarh was attended by more than 170 participants from the local Marble Industry and government organisations and by more than 150 participants at Udaipur.

16. The National Disaster Management Authority (NDMA) has entrusted BMTPC the task for preparation of updated Earthquake Hazard Maps and Atlases having information upto Taluka level. The Council has completed preparation of updated Earthquake Hazard Zoning Map for the whole country upto district level based on the Survey of India administrative boundary data. Subsequently, it was desired by NDMA that boundary data of sub-division (blocks) to be taken from Census of India Atlas 2011. The NDMA has approached Census for providing data. The data from Census is awaited. As soon as the data regarding sub-district level is available from the Census, it will be incorporated and maps will be redeveloped.

17. The Bihar Institute of Public Administration and Rural Development (BIPARD), Government of Bihar at the behest of the Bihar State Disaster Management Authority requested BMTPC’s assistance in conducting Training of Trainers (TOTs) on Earthquake Resistant Design and Construction. In order to impart training, standardised Resource material for Training of Engineers and Architects in earthquake resistant design and construction was prepared in association with Deptt. of Earthquake Engineering, IIT Roorkee. The series of Training of Trainers (TOTs) Programme was kick-started by organisation of Sensitization Programme on “Earthquake Resistant Design and Construction” jointly with IIT Roorkee in January, 2013 at Patna. So far seven batches of the TOTs have been organized at Patna. The resource persons were from IIT Roorkee, IIT Mumbai, NIT Patna, BMTPC including other experts in the field. At the end of training of each batch, evaluation of trainees was done through examination.

18. The Council brought out a publication titled “Methodology for Documenting Seismic Safety of Housing Typologies in India” based on the study undertaken by BMTPC with IIT professors and others. This document describes housing sub-typologies practiced in seismic zones in seven locations in moderate to severe seismic zones in India. With description of an ‘Ideal House’ of the typology in focus, it identifies deficiencies of the existing houses from seismic safety point of views and also represents a methodology for undertaking technical documentation of housing typologies on a larger scale.

19. Two Training Programmes were organised for Masons on Alternate and Cost Effective Housing Technologies at the site of ongoing demonstration housing project at Rae Bareilly, U.P. on April 21-22, 2013 and October 29-30, 2013. 22 local masons were trained during the first programme and 20 masons during the second programme. It may be mentioned here that

the masons trained during this housing projects have shown competence in the alternate technologies such as rat-trap bonds, filler slabs etc. and some of them informed that they have their hands full for next six months with similar projects in the area. Apart from this, a Training Programme was also organized for prospective engineers on 8 February 2014 wherein 70 civil engineers student from KNIT were provided training.

20. The Council prepared “Building Artisan Certification System”. The system consist of eight certificate modules including (1) Assistant Mason, (2) Mason, (3) Disaster Resistant Construction (iv) RC Construction (v) Concreting, (vi) Bar Bending, (vii) Repairs of Masonry Structures, and (viii) Alternate Building Technologies. Out of these eight modules, the pilot assessment of candidates is being carried out under this project for the Assistant Mason and Mason Certificates. During the year, four batches of Training Programmes were organized at Halisa, Palundra and Bopal in Ahmedabad and 41 candidates were provided training.

21. The Council organised a Training Programme on Building with Bamboo at Imphal, Manipur from 26 – 29 June 2013 jointly with Manipur State Bamboo Mission, Forest Department, Government of Manipur and South Asia Bamboo Foundation (SABF). During the programme training were provided to 30 participants. During the Training Programme, a Bamboo Gazebo was constructed by the participants under the guidance of master crafts mason at Kangla fort, Imphal for practical training. The Gazebo was handed over to Deptt. of Arts & Culture, Government of Manipur, Imphal.

22. The Council organised the Training Programme on Building with Bamboo at Shillong, Meghalaya from 2 – 4 December 2013 jointly with Forest Department, Government of Meghalaya. During the programme training were provided to 30 participants. As done earlier, during the Training Programme a Bamboo Gazebo was constructed by the participants under the guidance of master crafts mason in Shillong for practical training.

23. As an appraisal agency, the Council appraised 90 projects under Rajiv Awas Yojana (RAY) out of which 62 projects were sanctioned by CSMC from the States of Uttarakhand, Gujarat, Karnataka, Rajasthan, West Bengal, Maharashtra, Haryana, Madhya Pradesh, Nagaland and Arunachal Pradesh.

24. Review of the TPIM reports for 441 BSUP and IHSDP projects for the States i.e. Arunachal Pradesh, Gujarat, Haryana, Karnataka, Maharashtra, Madhya Pradesh, Sikkim, West Bengal, Assam, Delhi, Nagaland, Bihar, Chandigarh, Chhatisgarh, Himachal Pradesh, J&K, Meghalaya, Mizoram, Orissa, Punjab, Rajasthan, Tamil Nadu, Tripura, Uttarakhand and Uttar Pradesh has been completed.

25. The Ministry of HUPA is implementing projects under 10% Lump-sum Provision for NER States including Sikkim. The Council has been designated as one of the Appraisal Agency for appraising the projects received under 10% Lump-sum Provision for NER States including Sikkim. During the year 8 projects from Assam, Manipur, Tripura, Mizoram, Nagaland and Arunachal Pradesh have been appraised.

26. As regards capacity building programmes, BMTPC participated & extended handholding to the State Govt., Consultants etc. as per the directions of Mission Directorate.

## **Performance during 2014-15 (upto December, 2014)**

1. BMTPC is actively involved in providing technological interventions so as to construct houses with speed and quality with due care for structural, functional and environmental requirements of diverse geo-climatic and hazard conditions of the country at affordable cost. In this direction, the Council has identified more technologies namely Waffle Crete Technology, Koto Low Cost & Affordable Homes, Rapid Panel for slabs & walls, Aluminium profile based structure and Moladi Building System during the year.

2. Development of a matrix containing different parameters related to performance, constructability, system complexity, economy, safety & quality and environmental in association with RICS School of Built Environment Amity, University is in progress. Draft has been prepared containing primary and secondary attributes. This draft document has been circulated to related agencies and experts for their suggestions and will be uploaded in the public domain.

3. Detailed Technology profiles have been prepared for the following potential technologies:

- Speed Floor system
- Light Gauge Steel Structure (LGSS).
- Expanded Polystyrene Core Panel System
- Industrialized 3S System using cellular light weight concrete slabs and precast columns.
- Monolithic Concrete Construction using plastic-aluminium formwork
- Monolithic Concrete Construction using aluminium formwork
- Glass Fibre Reinforced Gypsum (GFRG) Panel Building System
- Factory made fast track modular building system.

The booklet entitled “Prospective Construction System for Mass Housing” containing these Technology Profiles on Emerging Technologies was released by Secretary, Ministry of Housing & Urban Poverty Alleviation, Government of India during a one day National Seminar on Green Building Materials & Construction Technologies organized by BMTPC on August 29, 2014 at New Delhi

4. In order to formulate the concept of Building Technology Park at HPL campus, New Delhi and to assess the involvement of various technology/system providers in the proposed venture, an interactive meet was organised under the Chairmanship of Joint Secretary (RAY & JNNURM), Ministry of Housing & Urban Poverty Alleviation, Government of India on 4<sup>th</sup> August, 2014 at New Delhi. Around ten Technology Providers participated in the meeting besides few experts in the field. Most of the technology providers agreed to provide full support in setting up the Building Technology Park at HPL Campus, New Delhi. A tentative design of the Building Technology Park was prepared. It was decided during the interactive meet that a Working Group may be formed to work out the further modalities of its functioning. Accordingly, a Working Group was constituted by the Ministry. After a series of the meeting of the Working Group, a planning document was prepared and submitted to the Ministry for consideration.

5. A meeting with Vice Chairman and senior officials of DDA was held, where a presentation was made by BMTPC on emerging housing technologies. DDA showed keen

interest in adopting the emerging technologies in their future projects. Vice Chairman also offered to space 5 acre of land for showcasing of these technologies. The Ministry has received a letter from DDA for identification of land in Rohini for development of Technology Park. After the visit by BMTPC officials to the sites identified by DDA, a suitable site having an area of 12850 Sq.mts has been selected in Rohini. A concept plan for setting up Building Technology Park has also been submitted to DDA for allotment of said land to BMTPC.

6. In order to sensitize the officials of the State Government regarding Emerging technologies, one day interactive meet was organised in Hyderabad on 11 Oct.2014. Around 150 engineers of Andhra Pradesh and Telangana State Housing Corporations participated in the Meet. Ten Technology Providers showcased their technologies during the interactive meet.

7. The Council has initiated preparation of model designs for cluster of houses using GFRG Building Panel System and panel building system using steel mesh, polystyrene core and chipping concrete. Regarding GFRG Panel System, drawings for typical plan have been given to IIT Chennai to develop the design manual with all detail. For other technology, Technology provider is being approached to provide detailed design.

8. BMTPC has developed Schedule of Rates (SOR) for GFRG Panel System in association with IIT Chennai. SOR for Monolithic Concrete Construction using aluminium/plastic formwork is in progress.

9. The Council organized a Brain Storming Session on Understanding the Bottlenecks in use of Emerging & Alternate Housing Technologies in Housing Schemes for providing Housing for All on 17th September, 2014 at New Delhi. The Brain Storming Session was chaired by Secretary, Ministry of Housing & Urban Poverty Alleviation in the presence of Joint Secretary & Mission Director (JNNURM & RAY). The Brain Storming Session was attended by 34 participants from various R&D institutions, State Housing Depts./Boards, Academicians, Technology Providers and Experts in the field.

The major recommendations of the Brain Storming Session are as under:

- Preparation of a Concept Note for setting up a Technology Sub-Mission on new emerging building technologies in Ministry with BMTPC.
  - Finalization of Matrix for selection of technologies.
  - Preparation of model tender for technology neutral construction.
  - Preparation of Directory of technologies, technologies providers, Engineers, Architects involved in emerging technologies.
  - Creating a portal, where technology providers can place information on new emerging technologies.
  - Documentation of success stories of emerging technologies.
  - Working on a proposal on fiscal and policy intervention to bring level playing field between emerging new technologies and conventional system.
  - Hand holding of professional engineers, architects and skill up gradation of artisan
- Work on these recommendations have been initiated by Council.

10. Code of Practice for design of GFRG Building Panel System has been drafted and has been submitted to Bureau of Indian standards (BIS) for formulation of Code of practice and Specification for GFRG Building Panel system is under preparation.

11. A draft of the Technology Sub Mission under the proposed New Housing Mission has been prepared and submitted to Ministry of HUPA. Under the technology Sub Mission it is proposed that BMTPC would be working in the areas of emerging technologies, proven/green technologies and good construction practices along with safer construction. A core group with the participation of Ministry of HUPA is proposed to be constituted for facilitating emerging technologies in different states and other related matters. The Terms of Reference (TOR) of the core group has been prepared and submitted to Ministry.

12. In order to facilitate inclusion of new technologies into tender by State Govts, a model tender for technology neutral construction has been prepared and is under finalisation.

13. Initiated preparation of Directory of technologies, technologies providers, Engineers, Architects involved in emerging technologies. A format for submission of data by the technology/system providers was prepared and uploaded on the website of council. Data from technology/system providers is being collected.

14. Initiated a process for creating a portal, where technology providers can place information on new emerging technologies and also initiated documentation of success stories of emerging technologies.

15. Training module of two days on good construction practices, new & green technologies and earthquake resistant construction is being prepared for professionals. 1<sup>st</sup> training programme is scheduled to be organized in February 2015.

16. BMTPC has held discussion with the Bureau of Indian standards (BIS) to consider proposal for introduction of suitable provisions in the proposed section of National Building Code likely to be published in 2015, about selection and evaluation of new emerging technologies. The draft of the chapter has been prepared and forwarded to BIS for necessary action.

17. BMTPC organized a one day National Seminar on Green Building Materials & Construction Technologies on August 29, 2014 at New Delhi to deliberate on the various issues in the area of green building materials and technologies, its applications in mass housing including emerging trends. The Seminar also provided an opportunity to comprehend the new developments taking place in the construction sector as regards emerging materials and construction system and raised issues related to mainstreaming the Green Building Materials & Construction Technologies. The Seminar was inaugurated by Secretary, Ministry of Housing & Urban Poverty Alleviation, Government of India and Joint Secretary (Housing), Ministry of Housing & Urban Poverty Alleviation also addressed the august gathering. Besides the experts in the field, Technologists and Scientists working in the area of green building materials and construction technologies, Technology providers for building products, Academicians from various engineering and architectural colleges and students, Product manufactures of building components and Builders, real estate developers, etc. participated in the Seminar.

18. Three design packages including detailed drawings and estimates for construction of demonstration houses using marble slurry waste were prepared.

19. Design packages are under various stages of preparation for affordable housing for i) Western Region ii) Central Region iii) Kolkata iv) Coastal Region of AP v) Hilly Areas of Uttaranchal & Himachal. In order to finalise the design packages one Workshop was organised in Vijaywada and another in Kolkata.

20. The Council organised a Training Programme on Bamboo structures for housing and construction at Haflong, Assam from 29<sup>th</sup> October to 1<sup>st</sup> November, 2014 jointly with Dima Hasao, Forest Department, Government of Assam. During the programme training were provided to 20 participants. During the Training Programme a Bamboo Toilet was constructed by the participants under the guidance of master crafts mason in Haflong for practical training.

21. Under Performance Appraisal Certification Scheme of BMTPC, a meeting of Technical Assessment Committee (TAC) was held on 18-19 Sep., 2014 at Raigarh and award of PACs were approved for Light Gauge Steel Structure System and Speed Floor System. The TAC also approved renewal of PAC on GFRG Building panel technology. In addition, the following technologies are under various stages of evaluation:

- Quickbuild 3D panels technology
- Concrete Wall panels based on Schnell wire System
- Waffle Crete System , Ahmedabad
- Composite Plumbing Pipes and fittings-KITEC industries, Mumbai
- Bamboo wood flooring.

In order to popularise PAC Scheme, letters have been sent to many agencies to apply for PACS for their new products and systems. An advertisement on PACS has also been published in leading News Papers.

22. A blog for providing details of technologies, construction practices, success stories, professionals involved is being created on the website of council. Draft concept has been prepared.

23. As a part of the World Habitat Day Celebrations 2014, BMTPC organised Painting Competition for Differently Abled Children on the theme “Voices from Slums” in the categories viz. Mentally Challenged, Hearing Impaired and Visually Impaired. The winners were facilitated during the World Habitat Day Celebration Function in New Delhi in October, 2014. The publications which were also brought out to mark the occasion are (i) Special Issue of Newsletter “Nirman Sarika”, (ii) BMTPC’s Building Artisan Skill Certification System and (iii) Rapid Visual Screening (RVS) of Buildings of Masonry and Reinforced Concrete as prevalent in India

24. Three days Indo-Norwegian Training Programme on Seismic Design of Multi-storey Buildings: IS 1893 vs. Eurocode 8 from May 26 to 28, 2014 at New Delhi was organized by BMTPC jointly with Indian Institute of Technology, Roorkee(IIT Roorkee) and NORSAR, Norway. The programme was attended by around 100 participants from various parts of the country as well as from Nepal. The course was specifically targeted to Structural & Geotechnical Engineers and Designers in public and private sectors with emphasis on real-

life problems and tackling them through hands-on training. Another programme was organised from 13-15 October, 2014 at New Delhi wherein 80 engineers participated in the training programme.

25. BMTPC participated in HUDCO BuildTech 2014 and put up exhibition on Alternate and Emerging Building Materials and Construction Systems during India International Trade Fair from 14-27 November, 2014 at Pragati Maidan, New Delhi. BMTPC exhibition included participation by six technology providers/ companies in the area of emerging housing technologies by putting up the display within the BMTPC area. Having wide range of products and housing technologies for individual houses to mass housing solutions, the exhibitions attracted large number of visitors.

26. On the request of the Bihar Institute of Public Administration and Rural Development (BIPARD), Government of Bihar BMTPC has planned to conduct programmes for Training of Trainers (TOTs) on Earthquake Resistant Design and Construction. During the year, two batches of TOTs were organised from 11-14 November, 2014 and another two batches from 18-21 November, 2014 at BIPARD Campus, Patna

27. Last year, the National Disaster Management Authority (NDMA) entrusted BMTPC the task for preparation of updated Earthquake Hazard Maps and Atlases having information upto Taluka level. The Council completed preparation of updated Earthquake Hazard Zoning Map for the whole country upto district level based on the Survey of India administrative boundary data. Subsequently, it was desired by NDMA that boundary data of sub-division (blocks) to be taken from Census of India Atlas 2011. Recently the data from Census of India has been made available to NIC which will provide VPN account to retrieve data by BMTPC and updated Earthquake hazard maps will be prepared based on Census data.

28. Seismic Design Manuals for Earthquake Resistant Design & Construction is under publication. For publication of the manual, an Expression of Interest from various publishers has been invited and are under scrutiny.

29. Under “Building Artisan Certification System” Programme of BMTPC, training curriculam for barbenders has been finalised. Selection of Masons, barbenders and shuttering work force have been undertaken in Gujarat and Utrakhhand for certified training programme. Assessment of registered candidate of Batch 2 for mason has been completed at Mangrore, Junagarh, Gujarat. The training is being started in the first week of February, 2015

30. As an appraisal agency, the Council received 50 projects under Rajiv Awas Yojana (RAY) from Ministry of HUPA. Out of which 30 projects were approved by CSMC and for balance 20 projects observations have been forwarded to different states for compliance.

31. 7 projects were received under JNNURM for appraisal from Ministry which were approved by CSMC.

32. 11 projects were received under AHP for appraisal from Ministry. Out of which 8 projects were approved by CSMC and for remaining 3 projects observations have been forwarded to different states for compliance.

33. 37 projects were received from Ministry for appraisal under 10% Lump-sum Provision for NER States including Sikkim. Out of which appraisal report for 4 projects have

been forwarded to Ministry and for balance 31 projects observations have been forwarded to NE states for compliance and appraisal for remaining 2 projects are under process.

34. 48 project sites from different states were monitored under JNNURM / RAY

35. 166 TPIMA reports were received during the year from Ministry. 335 TPIMA reports were reviewed and submitted to Ministry including previous TPIMA reports. Out of which 32 TPIMA reports are under process.

36. As regards capacity building programmes, BMTPC participated & extended handholding to the State Govt., Consultants etc. as per the directions of Mission Directorate.

37. BMTPC has undertaken documentation of Best Practices under JNNURM and RAY. Format has been finalized and data is being collected.

## **Chapter – V**

### **Financial Review**

The Ministry of Housing & Urban Poverty Alleviation sanctioned grants-in-aid amounting to Rs. 550 lakhs, Rs. 400 lakhs, Rs.550 lakhs, Rs.500 lakhs, 500 lakhs and 500 lakhs for the years 2009-10, 2010-11, 2011-12, 2012-13, 2013-14 and 2014-15 respectively and the Utilization Certificates upto 2013-14 have been submitted to the Ministry. The overall expenditure relating to the activities is Rs.789 lakhs, Rs.705 lakhs, Rs.822 lakhs, Rs.839 lakhs, Rs.1027 lakhs and Rs 713 lakhs (up to 13<sup>th</sup> Feb. 2015) for the years 2009-10, 2010-11, 2011-12, 2012-13, 2013-14 and 2014-15 respectively.

## **Chapter – VI**

### **Review of Performance**

The Council, with the aim of assessing its impact and evolving an appropriate strategy for its growth and improving efficiency in its delivery of expected services, has subjected itself to four Reviews.

The first Review was undertaken as an in-house self assessment in 1997-98 and its report was presented to the Board of Management in their meeting held on 27<sup>th</sup> August, 1998. While appreciating the progress achieved and the impact that has been made on the growth and development of building materials sector by activities and efforts of the Council, the Board directed that a Review and impact Assessment Study be made by an outside agency beyond the in-house exercise.

Accordingly, the National Institute a Construction Management and Research (NICMAR), Mumbai conducted a Impact Assessment Study of BMTPC in 1999. The Report was submitted to the Ministry of Urban Employment and Poverty Alleviation.

Later the Ministry of UE&PA (now Ministry of Housing & Urban Poverty Alleviation) constituted yet another Committee under the Chairmanship of Shri Satish Chandra, Joint Secretary, Ministry of Rural Development, with Dr. T.V.S. Appa Rao, Director Structural Engineering Research Centre, Chennai and Shri P.K.Garg, Executive Director (Building Technology) HUDCO as its members. An Interim Report titled Performance Analysis of BMTPC of this Committee was submitted to the Ministry in January 2000.

The Ministry of UE&PA again constituted a Committee headed by the Joint Secretary (Housing), MoUE&PA with Director (Housing), Director(Finance), MoUE&PA; Director, CBRI, Roorkee and Chief (BMT), HUDCO as members, for review of BMTPC as per Expenditure Reforms Commission regarding Autonomous Institutions. The Committee submitted its report in January, 2003.