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தேசிய கட்டிட
ஆராய்ச்சி
நிறுவனம்

NATIONAL
BUILDING
RESEARCH
ORGANISATION

2015 වාර්ෂික වාර්තාව
ஆண்டறிக்கை
ANNUAL REPORT

ආපදා කළමනාකරණ අමාත්‍යාංශය
அனர்த்த முகாமைத்துவ அமைச்சு
Ministry of Disaster Management

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About NBRO

NBRO is a leading R & D and technical service provider institution and the national focal point designated for landslide disaster. Being a multidisciplinary institution experts from multiple disciplines team up and dedicate their services to NBRO to fulfil its set goals ultimately to achieve disaster resilient safe environment in the country. People seek NBRO assistance when confronted with a diversity of problems in their living environment, be that due to rumbling mountains, soft grounds, polluted air, contaminated water, poor construction and substandard building materials etc. NBRO as a dutiful service provider is always geared up to provide suitable solutions to maintain and improve the quality of life of all citizens.

As its designated functions NBRO carry out landslide hazard identification, zonation, mapping, risk assessment, issuing landslide early warning, awareness and training, and mitigation. It is also an assigned responsibility of NBRO to issue Landslide Risk Assessment Reports (LRAR) for any construction and development activity in landslide prone areas in the country.

NBRO is a self-funded institution and to earn its recurrent expenditure NBRO provides testing and technical consultancy services to the general public, public sector institutions, private companies and international institutions. With the support of its fully-equipped soil-testing laboratory and drilling equipment NBRO conducts geotechnical engineering investigations as a consultancy service, and investigations of most large infrastructure development and landslide mitigation projects in the country had been performed by NBRO. In addition, testing of building materials for suitability in construction and certification, disaster risk assessment, environmental quality assessment of water, wastewater, soil, sediment, air and emissions ensuring safety of humans and environment, and related studies leading to impact studies and status management are offered as technical consultancy services by NBRO and these bring in NBRO its much needed revenue. NBRO also offers consultancy services on project management of construction projects and also a unique service of condition reporting of damaged buildings. Human settlements planning and developing cost effective disaster resilient housing are yet more consultancy services offered by NBRO.

Presently NBRO is collaborating with local and international agencies in research, in mitigation projects and in the effort to building disaster resilience in the country.

EXECUTIVE REPORT

Once again, NBRO has taken great strides to advance itself as a nationally important institution and contribution and commitment of staff towards achieving the present status of NBRO had been outstanding. Thus, I am pleased to compile and present this Annual Report and the Financial Statement of NBRO for the year ended on 31st December 2015.

NBRO again earned its highest ever turnover recorded in NBRO's history in 2015; showing 48 % increase on the previous year's record of Rs. 415.4 Mn. turnover. This is a direct result of engaging in large projects and completing collaborative work together with national and international partners. By the end of December 2015, NBRO had the highest number of total staff strength in its cadre which is 348.

Market for consultancy work in 2015 was dynamic and growth in consultancy work was somewhat similar to the growth in 2014, even though the competition from other competing public and private institutions was very strong. NBRO continued to win the award of much prestigious project consultancy work. Continuing the trends from 2013 onwards the workload of staff kept increasing and it necessitated recruitment of more staff as result of which the staff strength rose from 257 to 348 within the year. The increase in the yearly revenue, denoting the rise in the yearly revenue graph is given elsewhere in this report.

Eventually, I am happy to proclaim that NBRO as a reputed public enterprise excelled in its performance in 2015 in all areas, and met its set targets, and in addition, NBRO continued to thrive achieving its corporate objectives in a responsible manner in an ever challenging socio-economic environment.

Productivity has been high in 2015, delivering quality products within tight time targets and avoiding delays at work. Client satisfaction has been high and complaints have been low too. Such situation gave NBRO a strong, competitive edge over competitors, and led to the NBRO's success in winning very competitive bids. This was a result of its very high level of performance, coupled with the commitment, and dedication of its devoted staff. Consequently, NBRO now stands as one among the most trusted technical service providers in the country serving several sectors covering disaster management, housing, construction and environment.

NBRO as a line agency of the Ministry of Disaster Management has a key role of being its only technical agency. Thus NBRO strongly focuses onto the technical aspects of building disaster resilience in the country. NBRO's effort, as depicted by its Corporate Plan, concentrates strongly onto creating disaster resilience in the country, through its Research & Development, mitigation, awareness creation and training programs.

In 2015, the government allocation for research was LKR 15.0 Mn. NBRO utilized these funds on disaster management related research, details of which are given by this report.

In view of promoting disaster resilient construction in the country NBRO conducted periodically training and awareness programmes to craftsmen, technical officers,

and other construction industry professionals and NBRO will continue this work in the coming years as well. “Disaster Resilient Construction Manual’ compiled by NBRO was published last year which denoted a significant step taken towards mainstreaming disaster resilient construction concepts into building and construction industry. NBRO developed a methodology for conducting landslide hazard risk assessment in local schools, and compiled “School Safety Toolkit” which is now being promoted. In view of promoting disaster resilient houses NBRO designed several model houses incorporating resilience against landslides, floods, tsunami and high winds and constructed some model houses for display.

In the NBRO research and development programme, landslide hazard zonation mapping continued and as a new improvement, generation of exposure maps by interposing buildings layer on to existing hazard zonation maps commenced. Several studies were conducted on landslide monitoring and prediction, one important study being the establishment of threshold rainfall intensities for Sri Lankan slopes.

In building materials studies, an important research study was conducted on the manufacturing of cement blocks using bottom ash waste of the coal-fired power plant in Nuraichcholai in place of traditional river sand. Engineering and chemical properties of these blocks were found to be satisfactory. A study was conducted on developing a ready mix motor pack using quarry dust in place of natural sand. Use of demolition and construction waste in making precast wall panels was researched while collaborating with University of Moratuwa. Developed wall panels showed sufficient strength and good thermal properties. In the geotechnical engineering field, R&D work continued on subsurface mapping in vulnerable areas, and in green wall techniques in retaining wall construction.

CONTRIBUTION TOWARDS NATIONAL DEVELOPMENT

Disaster Risk Reduction is a priority are in the Ministry of Disaster Management. The national goals set by the Ministry are to achieve 95% reduction in loss of lives and 40% reduction in loss of property due to disasters. In this NBRO as the focal point for landslide studies in the country, played an important role in landslide disaster risk reduction and conducted several vital functions.

NBRO continued the Landslide Hazard Zonation Mapping Project with annual grants being given by the GOSL and the hazard zonation maps produced by this project are frequently referred by stakeholders, including the staffs of local government bodies in planning and approval work, and planning agencies such as Urban Development Authority, National Physical Planning Department etc.

In the Landslide Risk Assessment Report issuance work, NBRO issued reports with technical recommendations to local government bodies for granting approval for construction or development activities in landslide hazard-prone areas. NBRO now has ten district offices functioning full time in landslide prone districts for this issuance work. They received about 8000 applications for processing in 2015 and issued 7800 reports now adding to a total of 45,627 applications processed since the inception of issuance process in March of 2011.

NBRO carried out the very important responsibility of landslide early warning. In order to facilitate the early warning work, NBRO has a network of over 100 automated rain gauges installed in highly vulnerable areas, that continuously transfer data on rainfall to computers in NBRO and at the moment, NBRO is developing instrumented monitoring of landslides to detect ground movements for the real time landslide hazard forecasting and early warning.

The United Nations Development Programme (UNDP), Japanese International Cooperation Agency (JICA), Norwegian Geotechnical Institute (NGI) and Asian Disaster Preparedness Centre (ADPC) all assisted NBRO to carry out these important functions.

NBRO now has successfully completed many landslide mitigation projects and handed over mitigated sites to the communities and local government authorities including Peradeniya (2009-2013), Padiyapallala (2010-2013) and Diyathalawa (2014-2015). Landslide mitigation projects at Garandiella (2011-2015), Punchi Rattota (2013-2015), and Passan Watta (2014-2015) were near completion by the end of year under review. NBRO's effort in these projects has been appreciated by the affected communities and relevant local government bodies for ensuring the safety from dangers of the landslides.

Many different slope stabilization techniques were applied in above mitigation projects like removal of overburden, land re-shaping, retaining structures, turfs, surface drains, subsurface horizontal drains, soil nailing and cable anchoring. Investigations and the detailed design have been completed in several other prioritized landslide mitigation projects that will be implemented in future.

Three of the important projects are namely Badulusirigama near Uwa Wellassa University in Badulla district, Udamadura in Matale district and Alagumalai in Nuwara Eliya district will be completed with the technical and financial assistance of JICA and NBRO staff will be trained in newer technologies of landslide mitigation by Japanese experts. The JICA is further extending assistance technically and financially to a project to stabilize identified unstable roadside slopes in the national road network in the central hills. NBRO and the Road Development Authority (RDA) will jointly implement this project.

The World Bank is funding a similar project to stabilize certain other identified unstable slopes in national road network which NBRO will collaborate with the RDA to jointly implement under Climate Resilient Improvement Project (CRIP). The World Band is also providing funds to a project implemented by NBRO to stabilise unstable slopes in and around 18 identified schools in Kandy district under CRIP.

NBRO significantly commit itself to engage in corporate social responsibility activities along with its regular work across the island to create a safer built environment for the betterment of communities in the country. It is necessary to emphasize the fact that part of operational profits of NBRO from the generated revenue will be invested when funds are urgently needed for the completion of important work such as in either a mitigation project or landslide special investigations.

EXTENDING NBRO EXPERTISE

NBRO continued to provide its technical expertise contributing to development projects countrywide. They included investigation, design, knowledge transfer and training.

Important work among them was the technical expertise provided by NBRO on the stabilization of the failed slope in Southern Expressway at Welipenna (42 km) and at Kokmaduwa (114 km). NBRO has instrumented this slope and now continues real time monitoring of ground behaviour. This would enable closing of the Expressway in case of a possible slope failure. In a similar project NBRO extended technical expertise to stabilize failed slopes in Kandy - Mahiyangana road as well. NBRO has come in to an agreement with the Road Development Authority and extend its assistance accordingly.

NBRO uses its facilities and instruments in Resistivity Tomography Surveys and Ground Penetration Radar Surveys to study the subsurface conditions. Initially such studies were conducted in Matale district where

ground subsidence was first observed. Application of these methods is now applied to elsewhere as well and in one such study, subsurface in certain locations in Jaffna Peninsula was studied where suspected oil contamination of ground water was reported. NBRO collaborated with Norwegian Geotechnical Institute which extended their assistance in this study.

In another collaborative study, titled "Agricultural decision making and adaptation to precipitation trends in Sri Lanka", NBRO is working with the Vanderbilt Institute of Energy and Environment. A model to predict water availability in drought-prone zones was prepared at NBRO, and much field studies and questionnaire surveys were conducted from 2010 to this year. Output of this study is periodically reviewed by a committee and disseminated to stakeholders.

NBRO completed in 2015 the paid consultancy work 'Consultancy Services for Water Quality and Sedimentation Studies' in Dam Safety and Water Resources Planning Project of Ministry of Irrigation and Water Resources. NBRO earned revenue of over fifty million rupees from this project.

OUTCOME

NBRO endeavoured a great effort to reduce the landslide disaster risk in the country over the past decade. This in turn lowered the dangers of landslide hazard in the country to a considerable extent. The NBRO landslide disaster risk reduction programme was comprehensive and included all aspects; from site investigation, mapping, monitoring, early warning, mitigation, training, to awareness.

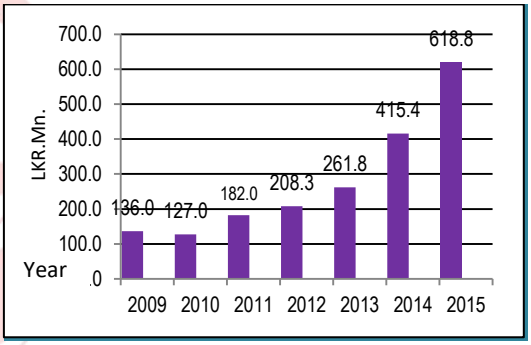
In year 2015, a few slope and embankment failures were reported, except for which major landslide disasters did not take place.

NBRO continued its assistance to the resettlement planning of victims of the landslides in the previous year, 2014. Extending technical assistance particularly to the resettlement of Meeriyabedda landslide victims is a major task entrusted to NBRO in 2015. NBRO listed in 2015 the most vulnerable landslides in the country and is presently pressing hard the authorities on early resettlement and other options.

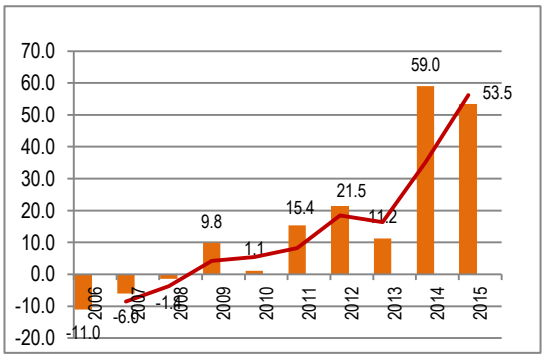
The government now invests on upcountry development only after establishing to well-planned risk management system where NBRO advice is always sought and its mediation is now a key instrument.

REVENUE

NBRO generates revenue for its recurrent expenditure mainly through consultancy & testing services offered to state and private sectors. As such NBRO heavily relies on its self-earned revenue to provide for staff salaries and most institutional expenses.

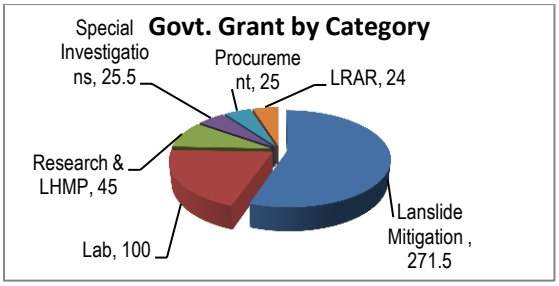


Total Operating revenue for last 7 years



Profit & loss record for last 10 years

Each year from 2010 onwards, NBRO recorded a net profit. Consolidated revenue of the year under review is the highest reported in the history of the NBRO. Total consolidated revenue LKR 618.8 Mn. reflects a growth of 48% over the previous year 2014. In this, the revenue component of around LKR 311.4 Mn. from testing and technical services shows remarkable growth.



Govt. Grant by Category - 2015

CONSTRAINTS

There are some obstacles identified as to hinder the progress of NBRO, and they are:

- ✓ Act of NBRO is to be redrafted and approval of relevant authorities should be taken before enacting by the Parliament. Absence of legal establishment is a significant weak point for NBRO.

- ✓ Experienced staff turnover at NBRO used to be high because of higher remuneration, and benefits facilities offered elsewhere. New recruits need time to get sufficient experience.

- ✓ NBRO is a self-funded institution, but it is difficult sometimes to work as a competitive entity because of the government regulations. This lowers NBRO's competitiveness.

INITIATIVES FOR PRODUCTIVITY IMPROVEMENT

NBRO in 2015 recorded remarkable progress to which the following actions proved to be productive.

- ✓ NBRO started renovation and construction work of its laboratory building complex.
- ✓ A design unit was established in NBRO to carry out design of the laboratory building complex and geotechnical engineering designs of mitigation of landslides and unstable slopes.
- ✓ JICA donated equipment for landslide risk management in 2015 and that enhanced the technical capacity of NBRO in landslide mitigation work.
- ✓ NBRO utilized the capital equipment grant from the General Treasury to enhance technical capacity of NBRO.
- ✓ More opportunities were given for foreign training and international exposure resulting in staff motivation.
- ✓ Working during afterhours was promoted by rewarding staff with added benefits.

FUTURE PLANS

NBRO Corporate Plan 2016- 2018 details the ambitious project implementation program that NBRO has envisioned for the next three years.

NBRO will endeavour completing as early as possible the three major landslide mitigation projects that have been already started with the technical and financial assistance of Japan International Cooperation Agency. This will be the start of mitigation of landslides in "Integrated Landslide Mitigation Project" where 16 landslide sites in the country needing mitigation had been identified and prioritized.

The program to mitigate unstable slopes surrounding 18 schools in Kandy district under CRIP will be completed by 2016. Stabilizing the unstable roadside slopes in the hill country with both the World Bank and the JICA are extending assistance during 2015 - 2016 period will be accelerated. NBRO will continue to extend all the assistance to the RDA in their projects especially on geotechnical engineering component of design, construction and remediation of slopes in the roads network.

APPRECIATION

I take this opportunity to thank the Hon. Anura Priyadharshana Yapa, Hon. Minister of Disaster Management, Hon. Dunesh Gankanda, Hon. Dy. Minister of Disaster Management, and Mr. S S Miyanawala, Secretary of the Ministry of Disaster Management and Chairperson of Interim Management Committee whose direction and guidance have paved NBRO the way to

this success.I also wish to thank members of IMC and Audit & Management Committee, the Director Generals of Department of Budget, Department of General Treasury, National Planning Department, Disaster Management Centre, and the Department of Meteorology, who deserve great appreciation.

In addition, I express my sincere thanks to our stakeholders and valued customers for their continued confidence on us.

I am grateful to the dedicated employees of NBRO without the help of whom we will not be able to perform so well and achieve the challenging targets set so high for the 2015. Above of all, superiority of our performance is attributed to this remarkably competent team, their knowledge, skills and professionalism which is the backbone of NBRO.

We will continue working cooperatively to improve the NBRO performance further in the coming years and accomplish the mission and objectives set by our Corporate Plan. We are sure that our team members will be very are supportive of each other and collaborate across teams in sharing ideas and achieving great outcomes.

Eng. (Dr.) AsiriKarunawardena
Director General

Vision, Mission and Corporate Goals

VISION

"Creating a safer built environment"

MISSION

Promote and sustain research and development and provide technical services for disaster risk reduction and safer built environment

CORPORATE GOALS

- To become the national leader in building disaster resilience & DRR Research
- To become a profitable institution
- To become a leading technical services provider
- To be a high performer as the national focal point for landslides and associated geo-hazards
- To continue as a centre for technological information

Management of NBRO

MINISTER IN CHARGE OF THE SUBJECT

Hon. Anura Priyadharshana Yapa
Hon. Minister of Disaster Management

Hon. Dunesh Gankanda
Hon. Dy. Minister of Disaster Management

Presently a Cabinet approved Interim Management Committee (IMC) with Secretary of the line ministry as the Chairman guides and directs the administrative, financial and management functions of NBRO.

INTERIM MANAGEMENT COMMITTEE

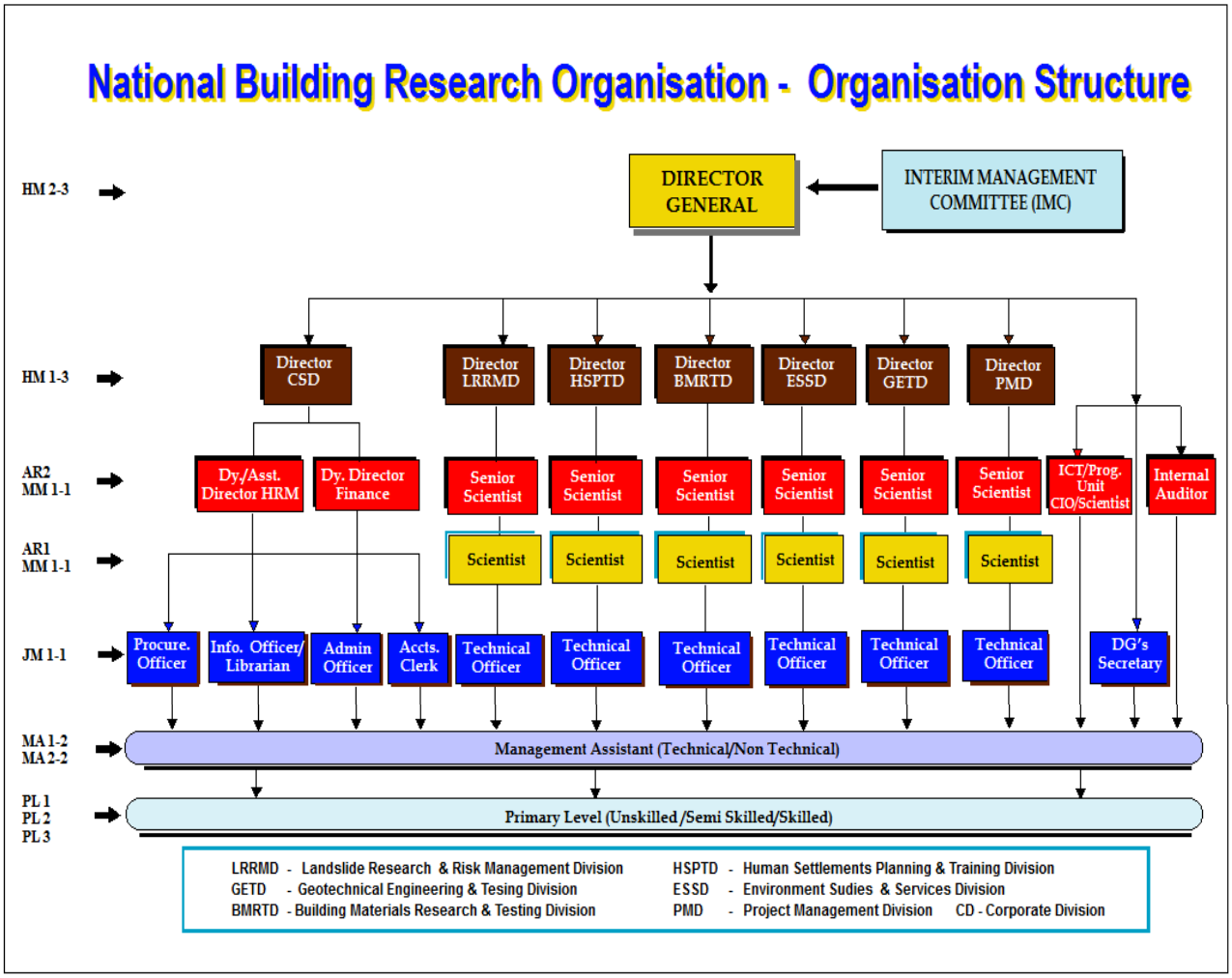
Mr. S. S. Miyanawala (Chairman) Secretary, Ministry of Disaster Management	**Eng. (Dr.) Asiri Karunawardena** Director General, National Building Research Organisation
Maj. Gen. L B R Mark (Retd.), Director General, Disaster Management Centre	**Mr. H R V P Wijewardena** Asst. Director, Department of National Budget
Eng. C D W Alahakoon Asst. Secretary (Technical), Ministry of Housing and Samurdhi	**Mr. H U R Fonseka,** Chief Accountant, Ministry of Disaster Management
Mr. Lalith Chandrapala Director General, Department of Meteorology	**Mr. H K Balachandra** Director General, Construction Industry Development Authority

AUDIT & MANAGEMENT COMMITTEE

Mr. A B R Amarakoon Audit Superintendent, Government Audit Branch	**Eng. (Dr.) Asiri Karunawardena** Director General, National Building Research Organisation
Mr. H R V P Wijewardena Asst. Director, Department of National Budget	**Mr. R K Jayaweera** Director (Corporate), National Building Research Organisation
Mr. H K Balachandra Director General, Construction Industry Development Authority	**Mr. P Rupasinghe** Asst. Director (Finance), National Building Research Organisation

Mr. H. L. Ruwanthilaka
Internal Auditor,
National Building Research Organisation

Organisation Structure



SENIOR MANAGEMENT

Eng. (Dr.) Asiri Karunawardena	Director General
Mr. R K Jayaweera	Director Corporate Division
Mr. R M S Bandara	Director, Landslide Research & Risk Management Division
Mr. Kishan Sugathapala	Director, Human Settlements Planning & Training Division
Ms. S V Dias	Director, Environmental Studies & Services Division
Mr. Kithsiri N Bandara	Director, Geo- Technical Engineering & Testing Division
Ms. S Muthurathna	Director, Building Materials Research & Testing Division
Ms. J. K. Jayawardena	Actg. Head, Project Management Division

OPERATIONAL HIGHLIGHTS-2015

Having made steady and impressive progress over the past three years National Building Research Organisation (NBRO) stands now as a leading R & D institution and technical service provider in the country. With its experts coming from multiple disciplines extending their invaluable inputs, and as an institution backed by its modern facilities, NBRO's expertise is sought in varying fields ranging from geotechnical engineering, building materials technology, human settlements planning, environmental management & engineering and project management and also in many other emerging fields in the country, landslide mitigation, ground subsidence, disaster resilience and drought adaptation.

NBRO presently serves as the research arm and the technical service provider of the Ministry of Disaster Management, as a result of which NBRO is now a main institution devoted to building disaster resilience in the country in view of achieving its mission "Safer Sri Lanka". NBRO recognizes the need to solve disaster related problems faced by the nation in their living environment, and is geared up to provide technical interventions to maintain and improve the quality of life of the people.

During the year under review NBRO carried out the following specific tasks in line with its designated functions, Corporate Plan and Annual Action Plan.

GOSL Funded Projects

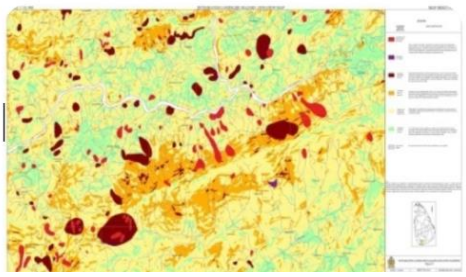
Landslide Hazard Zonation Mapping Programme (LHMP)

This project funded by the government identifies spatial distribution of landslide hazard and as an outcome, produces maps to the scales 1:10,000 and 1:50,000.Government grants are annually given to carry out his important task and in 2015, a sum of LKR 30.0 Mn. was spent for the mapping program. Total 5637 sq km (139 map sheets) have been mapped at 1:10000 scale while total 26,825sq km (8 districts 12 maps) have been mapped at 1:50000 scale under the project

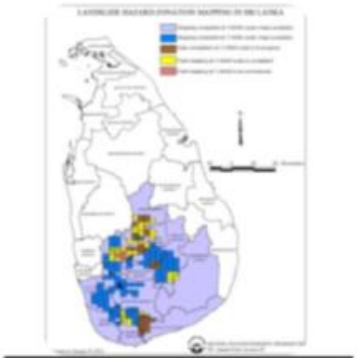
Following activities have been carried out during 2015.

- Digital data processing and gap filling of landslide hazard mapping in Badulla District – 100% (200 sqkm- 5maps)
- Field data collection and mapping of factor maps in gap filling of Ratnapura District – 100% (440 sqkm- 11maps)
- Preparation of 1:50000 Scale Landslide Hazard Mapping of Gampaha District – 100% (1387 sqkm – 1 maps)
- Conduct awareness programs in landslide prone districts (10 Programs)
- Assessment of resettlements sits and develop plans – 100%

These hazard zonation maps produced by this project are an indispensable national asset, because they are used in very important tasks of issuance of landslide early warning, and in all other landslide investigation work leading to hazard risk assessment, issuance of Landslide Risk Assessment Reporting, and identification and prioritization of potentially dangerous sites for mitigation. These are also now widely used in national and regional level planning by various institutions. Most of these maps are available for downloading free of cost in the NBRO website (www.nbro.gov.lk).



Hazard Zonation Map 1: 50,000 Scale



Area covered under LHMP

Landslide Risk Assessment Reporting Process (LRAR)

Since March 2011, NBRO carries out the issuance of Landslide Risk Assessment Reports (LRARs) and recommendations needed for all types of development and construction activities in landslide prone areas. These LRARs are now a pre-requisite for building permits approved by a local authority. As of end 2015, about 8000 applications were received out of which 7800 applications have been attended. The total applications processed so far since 2011 inception is 45,627. Treasury has provided LKR 24.0 Mn in the year 2015 to cover recurrent expenditure.

Landslide Special Investigations

As and when requested by District and Divisional Secretaries, or by officials of other governmental institutions NBRO performed landslide investigations for identification of risks in relation to neighbouring human settlements, infrastructure and plantations and further, provided immediate recommendations to ensure the safety of life and property. A total of 1587 investigations were performed over such requests in the year of 2015 for which the General Treasury provided LKR 25.5 Mn.

Landslide Mitigation Projects (GOSL Funded)

Stabilisation of unstable slopes in Passenwatta residential area in the Gampaha District

This project was also commenced in 2014 and to be completed in 2015 with funds from the General Treasury. The following work has been planned for implementation under this project.

1. Topographic survey, geotechnical investigations and design of mitigation measures
2. Compulsory reports; Socio economic survey and pre condition report
3. Construction of retaining walls and back slope preparation, and
4. Drainage improvement activities

Presently some of the major activities of the project have been completed and the part of retaining wall and the finishing work will be completed in the early 2016 before handing over the site to authorities.

Total estimated cost: LKR 35.0 Mn.
Time period: 2014– 2015

Total Estm'd Cost	Allocation of funds by the Treasury	
	2014	2015
LKR 35.0Mn	20.0	15.0

Mitigation of Garandiella Landslide

The mitigation of Garandiella Landslide commenced in 2011due to the severe landslide threat. This mitigation is done as an alternative to the relocation of 50 houses that were under the threat, relocation of Kothmale town or construct earthen dam to divert debris flow, diversion of debris flow downstream before Kothmale reservoir, or re-routing of few main roads.
Time period: 2011– 2015

Utilisation of Treasury funds				
2011	**2012**	**2013**	**2014**	**2015**
5.0	14.82	29.0	30.0	30.0

The major activities of construction & development in the project are:

1. Construction of surface drainage system
2. Construction of subsurface lateral drains including 3 vertical test holes (core drilling, piezometer installation, & horizontal drains) & retaining wall
3. Maintenance of existing surface drains
4. Maintenance of drainage well & installation of automatic pumps and power supply
5. Project management work
6. All major activities including erosion control measures were completed in 2015.

A part of surface drainage system and monitoring work will be completed in early 2016.

Garandiella Landslide Mitigation Project work in progress

Mitigation of Punchi Rattota deep seated landslide

This project was started in 2013 and was expected to be completed in 2015 with funds given by the General Treasury. The works planned in this project are the topographic survey, geotechnical investigations and design of mitigation measures and implementation of mitigation measures and construction of surface drains. By the end of 2015 most project activities have been completed. The part of surface drainage system and finishing work of the project will be completed in early 2016 and monitoring of the mitigated landslide will commence thereafter.

Allocation of funds by the Treasury		
Period	2014	2015
TEC Rs. 65.0 Mn.	15.0	20.0


Mitigation of Punchi Rattota deep seated landslide

Rectification of failed slope at Diyathalawa Main Bus Stand

The project was commenced in 2015 and completed in 2015 with the funds from the General Treasury. The work components of this project are:

1. Topographic survey, geotechnical investigations and design of mitigation measures
2. Earth work (demolition, earth excavation , reshaping & debris removal)
3. Slope protection (Soil nailing, Shot-creting and installation of steel net
4. Construction of drainage system

As a continuation, it has been proposed to cover masonry faces of the retaining structure with aesthetically appealing green wall by planting suitable varieties of plants. This work will progress aftermath of project completion.

Total estimated cost : LKR 52.0.0 Mn.
Time period: 2014– 2015

Total Estm'd Cost	Allocation of funds by the Treasury	
	2014	2015
LKR 52.0Mn	30.0	22.0


Rectification of failed slope at Diyathalawa Main Bus Stand

Landslide Mitigation Program

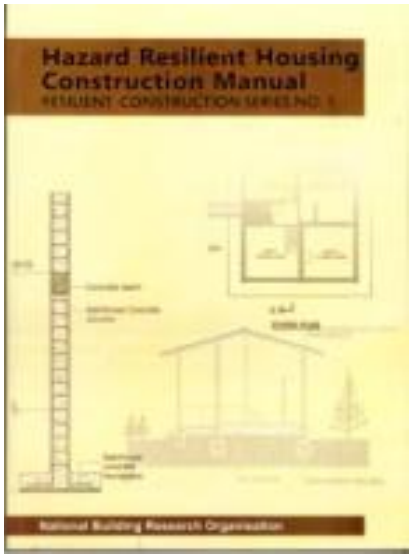
A project was formulated in 2015 to mitigate hazardous landslides and unstable slopes surrounding selected schools in several districts at a total cost of LKR 184.5 Mn and the project sites are listed below;

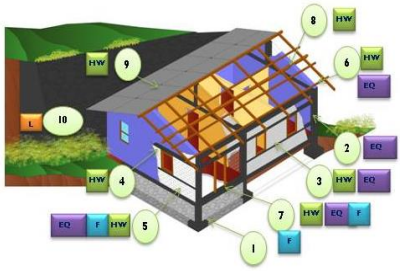
1. Wewegama Hospital- Phase I – Badulla – 50%
2. Imbulgoda- Phase I- Badulla – 30%
3. Sri Sudharma Maha Vidyalay, Liyanwala, Munwatta - Nuwaraeliya - 30%
4. Pussella Navodya Vidyalaya, Gammaduwa – Matale – 30%
5. Seewalii Central Collage - Rathnapura – 60%
6. Eheliyagoda-Udatalavitiya – Rathnapura – 10%
7. Kithulgoda Kanishta Vidyalaya – Kalutara – 30%
8. Batemulla Jathika Pasala – Galle – 45%
9. Jayawardena Vidyalaya, Batatramulla – Colombo – 70%
10. Poramba Vidyalaya – Matara – 35%
11. Mitigation of Peradeniya Landslide phase II 30%
12. Upgrade disaster resilience at Meeriyabedda resettlements site 45%

Research & Development Program

The government grant for research and development given to NBRO in 2015 was LKR 15.0 Mn. These funds were effectively utilised to conduct research and development projects described below that were primarily focused on building disaster resilience. Outcomes of this work were presented and published at the 6th Annual NBRO Symposium "Innovations for resilient environment" held on 22nd December 2015 at Auditorium of Ministry of Disaster Management. There were 34 technical papers altogether published in the proceedings.

R & D projects continued from previous year





Disaster- resilient Housing Construction Manual

Development of 'Disaster Resilient Housing Construction Manual':

Compilation of the manual prepared to assist home builders and construction professionals in incorporating disaster resilient features into the design and construction and also in learning correct construction techniques, was completed and published. Copies were distributed to stakeholder agencies and at the moment, steps have been taken to translate the manual into Sinhala and Tamil languages.

Housing design in landslide-prone areas

Model house resilient to tsunami

Constructing Disaster Resilient Houses Designed for Major Disasters:

In this research project, several model houses with disaster resilient features were designed and built. Details are as follows:

- Three resilient model houses in Hambanthota district (Katuwana - landslide, Tissamaharama - flood, Kirinda – tsunami)
- Three resilient model houses in Kaluthara district (Agalawatte – landslide, Millaniya - flood, and Beruwala - tsunami)
- Three resilient type model houses (Bingiriya, Puttalam district - flood, Mundalama, Puttalam district - high wind, and Kotiyakumbura, Kegalle district – landslide)
- Three resilient type model houses - under construction (Tangalle- flood, Baddegama-flood, Rathnapura – landslide)

Model house resilient to landslides

Model house resilient to high winds

Model house resilient to floods

R & D projects started this year

1. ***Development of light-weight building blocks with bottom ash from coal fired thermal power plants:***

   Bottom ash from the Nuraichcholai coal power plant is a waste material and this was used as a substitute to sand in the development of new type of a cement block. Engineering and chemical properties of developed blocks were found to be acceptable to standards. More research will continue in 2016 to build model houses as preparatory work for introducing to the market.

2. ***Developing a systematic approach of investigation for old public buildings and apartments (rental houses) in Colombo District in Sri Lanka:***

   There are many old buildings in Colombo. Some of them are being used as office buildings and some others as rental apartments. In both the cases the occupation density is high. In this study a rating system was developed to assess the risk of fire and structural aspects and it can be used as an analytical tool to judge the level of safety of such buildings.

3. ***Introducing new building materials for construction industry:***

   There is presently a need to identify and develop roofing materials suitable to Sri Lankan construction industry. In this study, investigating the physical, mechanical and thermal properties of common roofing materials in Sri Lanka was carried out. Calicut clay tiles, asbestos corrugated sheets and pressed cement tiles were checked according to SLS standards whether or not they meet the relevant requirements. Thermal conductivity was measured using Lee's Disk method.

4. ***Comprehensive approach for disaster resilient community building in Sri Lanka with special reference to landslide hazard: NBRO intervention:***

   In recent times it has been noted that the threat of landslide disasters affecting day to day life of communities and causing damage to life, property and environment is increasing. In this study, existing legal and procedural systems were analysed and a comprehensive approach developed disaster community building was developed to mitigate the threat.

5. *Design and development of a precast building system:*

In recent times construction of precast buildings has become useful because of their relatively shorter period of construction and savings on materials, that brings down the life cycle cost of a building. . Evaluation of indoor thermal and environmental properties of precast buildings was done to ascertain performance precast buildings in comparison to conventional buildings. Computer models were developed for the purpose of this study. In a parallel study comparison of embodied energy between a conventional building system and a precast building system was made.

6. *Subsurface geotechnical mapping for disaster resilient housing in low land area:*

There are problems frequently encountered when building housing in low land areas due to the poor subsurface conditions. With limited land available for building coupled with increasing population it is necessary to address such problems and provide suitable engineering solutions. In this study results of borehole tests conducted by NBRO over the past years were collected and a subsurface map for Colombo Municipal area was prepared. This map can be referred to obtain an idea about the subsurface before planning any building project.

7. *Disaster risk governance for minimizing drought impact and alleviating poverty and economic importance of irrigation water in Yala season:*

This study identified effects of drought and frequent water scarcities during dry seasons and difficulties in distribution of water through canal networks. This further examined methods of increasing net income of farmers through crop diversification during dry seasons. While taking Huruluwewa as case study, a series of stream water measurements and structured questionnaire surveys were conducted and computer models were developed to analyze collected data. Ideal crop mixes for different locations along distribution canals were ascertained. In a parallel study an assessment of returns to irrigation infrastructure investment at Huruluwewa was done taking into consideration the life expectancy of infrastructure in a typical irrigation system and factors affecting it. Returns on investment on renovations of irrigation infrastructure in Hururluwewa and relation between paddy production and irrigation water availability was established to calculate the net benefit of increased irrigation efficiency.

8. *Microclimatic modifications to increase the indoor thermal comfort level of dry zone residential buildings with special reference to Huruluwewa:*

Overheating of indoor environments is a major issue causing much discomfort in most areas in dry zones in equatorial tropics. Introducing passive design strategies can improve this situation. In this study, existing buildings in a selected area and various parameters affecting comfort level such as the surroundings, characteristics, orientation, and design were studied in detail and by analyzing data, design strategies were developed in view of preparing a guideline.

9. *Determination of the effect of anthropogenic pressure on watershed functions and the water quality degradation:*

Ecosystem resilience influences water quality of a stream because water quality is dependent of the ecosystem characteristics of a watershed. Using a conceptual model for Polgolla watershed stream water quality was related to fluxes of constituents in the ecosystem. Using this model land use systems in seven sub watersheds were studied and ranked for anthropogenic influence on stream water quality impairment.

R & D projects of 2015 that will be continued to 2016

1. *Building performance of sandwich panels made out of building debris & stabilized earth:*

In order to prevent over exploitation if conventional building materials it is necessary to introduce alternative materials and reuse of waste building materials. In view, Building Demolition Waster (BDW) and Stabilized Rammed Earth SRE) were used to construct composite walls that were tested for strength and suitability for construction. Satisfactory results have been obtained in the trials. Research has been continued in collaboration with University of Moratuwa. In one of the parallel studies, structural performance of composite walls made out of recycled construction waste and stabilized rammed earth was tested in the University of Moratuwa. In the other parallel study, design of an optimum mix for light weight compound sandwich panel fabricated using two fiber-cement boards with in-filled foam concrete containing cement, sand, expanded polystyrene and fly ash and attempt was made for identifying the optimum mix with having fly ash replacing the content of cement used and expanded polystyrene replacing the content of sand used.

2. *Review of landslide resettlement planning process:*

Each year resettlement of families in safe lands becomes necessary because of the imminent landslide threat on their settlements. Recent occurrence of landslides and slope failures aggravated this situation. A study was conducted to review the existing landslide resettlement planning process and it was noted that, in spite of this recurring need for resettlement, the planning process is often incomplete. In a parallel study, resettlement process for resettling victims of Meeriyabedda landslide was researched.

3. *Secondary consolidation characteristics of peaty clay in Sri Lanka:*

A study was conducted on the effect of preloading on secondary consolidation of peat clay considering the secondary consolidation that takes place during the service in the construction of high road embankments in lands underlain by thick layers of soft peat clay. This study will be continued in 2016.

4. *Establishing threshold rainfall intensities for slopes in Sri Lanka:*

Threshold rainfall intensity that can trigger a rain induced landslide can differ from one location to another. Then, developing location specific criteria for predicting landslide triggering probability becomes important and this research work attempted to establish such criteria for slopes in Sri Lanka. Tests using pressure plate apparatus to check the soil water characteristics were conducted in this research. Shear strength parameters of residual soil at different saturation levels can be determined by this test. Welipanna landslide was selected as the location for the research.

5. *Green wall technique for covering surface of engineered slope at Diyathalawa using bioengineering methodologies:*

Diyathalawa town situated in the hill country is a much sought destination of foreign and local tourists. Retaining structures have concrete and masonry surfaces that are aesthetically repulsive, as in the case of the reconstructed failed slope at the central area of this township. This study researched and recommended covering of such surfaces with a selected green vegetation which is more appealing to the eye.

6. *Ready mix plastering mortar pack incorporating quarry dust:*

This study investigates the possibility of making a ready mix plastering mortar pack using quarry dust and crushed rock sand in place of river sand which is short in supply. Quarry dust is the fines in a metal quarry producing mainly coarse and fine aggregate and presently considered as a waste product requiring disposal. Suitable mix proportions were developed to meet the compliance with general purpose plastering mortar and research study will continue in 2016.

Awareness creation and training programmes conducted by NBRO

1. *Training masons on Disaster Resilient Housing Construction*

NBRO conducted several workshops to train skilled masons in Rathnapura, Badulla, Nuwara Eliya, Hambanthota, Kaluthra and Polonaruwa districts on Disaster Resilient Housing Construction.


2. *Training Grama Niladharis in landslide prone areas on disaster risk reduction measures*

NBRO has conducted several workshops to train Grama Niladharis in Badulla and Kaluthara district on Disaster Risk Reduction measures for human settlements in landslide prone areas and disaster management. Main lectures were conducted in this workshop on: *what is a landslide; how to identify a landslide and mitigation of impacts; Landslide Risk Assessment Process and the importance of Disaster Resilient Housing Construction Methodologies.*


3. *Workshops for UDA Planning officers of Nuwara Eliya and Badulla Districts*

With the objective of integrating landslide hazard maps and landslide risk maps into UDA development plans, Urban Development Authority (UDA) together with National Building Research Organisation (NBRO) conducted a workshop for planning officers of Nuwara Eliya and Badulla districts on 29th September 2015 at the Sri Lanka Tourism Development Authority Resort, Nuwara Eliya.


Major Consultancy Projects

Reservoir Water Quality and Sedimentation Studies

This major study was undertaken for Dam Safety and Water Resources Management Project of the Ministry of Irrigation and Water Resources Management and it will continue up to 2015. Details of the project work are as follows;

Main Study:

- Analysis of WQ data bases. Polgolla, Kothmale,Kalawewa.
- Monitoring watershed water quality, Monitoring Reservoir water quality inPolgolla, Kothmale, Kalawewa
- Preparation of a watershed management plan for Polgolla reservoir
- Bathymetry survey of Polgolla, Inginimitiya, Kalawewa, Rantambe.
- Procurement of water quality monitoring & Bathymetry survey equipment for MASL

Monitoring of reservoir water quality

Establish Policy and a Methodology to Study Ambient Air Quality in Main Urban Cities in Sri Lanka by using Passive Air Quality Monitoring Technique

NBRO carries out this study in collaboration with Department of Motor Traffic and Ministry of Environment and Natural Resources. Data on air quality at identified cities are collected to assess the impact of vehicle emissions on ambient air quality in relation to the Vehicle Emission Testing programme.

Funds: VET funds through Registration of Motor Vehicles
Objective: To establish the ambient air quality database in main urban areas
Aim: Data collection and analysis for decision making in urban air quality management and transport planning for vehicular emission reduction

Project Component:
1. Colombo, Gampaha, Kalutara, Rathnapura & Galle, (Allocation - LKR 1.90 Mn. for 2012-2013)
2. Kandy, Kurunegala, Anuradapura & Badulla
(Allocation - LKR 1.50Mn. for 2013-2014)

Study Methodology: Sampling to represent different environmental conditions in urban areas in Colombo (19 locations), Gampaha (11), Kalutara (05), Ratnapura (11), Galle (06), Horana (05) and Monthly average exposure levels of SO_2 and NO_2 are measured.

Monitoring of air quality

Geotechnical Investigation Projects

NBRO continued to offer geotechnical engineering services to important infrastructure projects in the country. This work included ground exploration, testing of geo materials in its well-equipped laboratory and engineering design. Further, as research work, studies on understanding the behaviour of residual soil, expansive soil and peaty soil and finding appropriate construction technologies over the problematic soil types were conducted.

(1) *Soil Investigation for Landslide Mitigation work at Gerandiella*

Client	:	LRRMD
No. of Borehole Investigated	:	17 Nos
Project Duration	:	05.07.2015 – 20.09.2015
Project cost	:	6.8 Million
Status	:	Completed

(2) Ground improvement work at proposed multimodal center at Makumbura

Client	:	Ministry of Defense& Urban Development
Project Duration	:	June, 2015 to October, 2015
Project Cost	:	2.8 Million
Status	:	85% completed

(3) Detailed Geotechnical Investigation for Rectification of Kokmaduwa Landslide at 114 Km Post of southern Expressway

Client	:	RDA
No. of borehole investigated	:	07
Project Duration	:	05.10.2015 – 26.10.2015
Project Cost	:	4.0 Million
Status	:	Completed

(4) Soil Gravity Drainage Improvement for Rectification of Kokmaduwa Landslide at 114 Km Post of southern Expressway

Client	:	RDA
No. of borehole investigated	:	45
Project Duration	:	26.10.2015 – 02.12.2015
Project Cost	:	21.0 Million
Status	:	Completed

(5) Geotechnical Investigation for Haggala Landslide

Client	:	LRRMD
No. of borehole investigated	:	Completed (06 Nos), Remaining (04 Nos)
Project Duration	:	03.11.2015 – 25.02.2016
Project Cost	:	4.3 Million
Status	:	In progress



Geotechnical Investigation in progress

Other Income Generating Activities

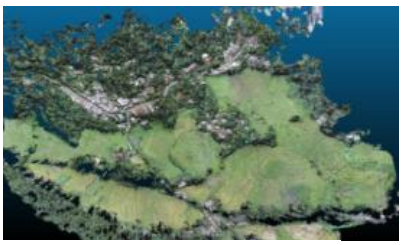
NBRO continued the provision of technical testing and consultancy services in the fields of landslide studies and services, geotechnical engineering, project management services, building materials, human settlements planning and environmental management and this work continued to strengthen the financial viability of the institution. Testing and consultancy services provided by NBRO are summarised below:

Activity/ Division	No of consultancy Jobs	No of Testing Jobs	Total Income Generated (LKR.Mn.)
Landslide Research & Risk Management Division	550	-	34.4
Geotechnical Engineering & Testing Division	70	107	100.6
Environment Studies & Services Division	5	530	55.4
Building Materials Research & Testing Division	-	2746	45.6
Project Management Division	130	-	17.8
Human Settlements Planning & Training Division	17	-	6.7
Consultancy for Foreign Funded Projects	2	-	36.0
Corporate Division			14.9
Total	**774**	**3,383**	**311.4**

Projects with Foreign/ Donor Collaboration

NBRO – NGI Technical Cooperation Project

Aerial photos by camera drone



3D model of Ratthota area

NBRO staff was trained by the NGI in Norway on ground penetration studies, land subsidence and ground remediation.

NBRO continued the project "Institutional Cooperation on Mitigation of Natural Disasters due to Climate Change" in collaboration with the Norwegian Geotechnical Institute (NGI) a world-renowned geotechnical institute with extensive experience in global studies.

The technical cooperation project continued with the NGI in association with Geological Survey of Norway and assisted in the interpretation of INSAR satellite imagery and aerial maps in the trend analysis of ground subsidence in affected areas.

In 2015 the NGI assisted NBRO in conducting a study on the suspected oil contamination of ground water in Jaffna Peninsula by sending a team of NGI experts. The report on findings was given to the relevant authorities in the Northern Province.

Another NGI team visited NBRO and conducted aerial 3D mapping exercise with NBRO staff using a camera drone. They also donated an automated rain gauge coupled with instruments to measure soil moisture etc installed at Matale and connected to the rain gauge network of the Landslide Early Warning System of NBRO.

Under the technical cooperation project a team of NBRO staff were trained by the NGI in Norway on ground penetration studies, land subsidence and ground remediation.

Royal Norwegian Embassy (RNE) in Colombo provides financial assistance to this project.

NBRO -Vanderbilt Institute for Energy and Environment (VIEE) of USA Technical Corporation Project

NBRO's collaboration with Vanderbilt Institute for Energy and Environment (VIEE) of USA started in 2010 and the two institutions agreed to conduct a five year study "Agricultural Decision-making and Adaptations to the Precipitation Trends in Sri Lanka" (ADAPT-SL)from 2012. The Climate Research Unit (CRU) of NBRO was later established to conduct the study.

Water scarcity was a reality in the past few years for farmers in the North Central Province who depended on either rain or irrigation water to grow paddy. They find themselves challenged by this situation and understand that adaptation to new farming practices such as crop diversification is required without relying on traditional practices to manage water.

Two doctoral students of Vanderbilt University and University of Colorado Boulder guided by experts from VIEE conducted field work and community profiling at Anuradhapura and Polonaruwa Districts together with NBRO staff in the period from 5th Aug to 31st Oct 2015. Further, they also carried out qualitative studies and data collection at Huruluwewa/ Galenbindunuwewa during this period for supporting and validating data collected through a farmer survey, understanding collective action within the major and minor communities, and understanding what farmers perceive to be the primary challenges to their livelihoods. Information on farmer decision-making and challenges will eventually compared to policy-maker's perceptions of the challenges facing agricultural communities in order to make policy recommendations.



Field survey in progress

UNDP-NBRO Technical Cooperation Project for enhancing real time landslide forecasting and early warning capacity of NBRO

The project for establishment of automated rain gauge stations in pre-selected catchments was commenced in the year 2013 and continued in 2015. One hundred of these stations are now working in the automated rain gauge network of NBRO for landslide early warning. The project will continue in 2016 at the end of which 160 stations will be connected to the network. This project is beneficial to the rural communities living in vulnerable areas.


Installation of automated rain gauges in progress in Elpitiya and Ingiriya

Landslide Mitigation Projects (Foreign Aid and Technical Cooperation)

Japanese Technical Cooperation for Landslide mitigation Project [Integrated Landslide Mitigation Project Phase I]

As prioritized by Integrated Landslide Mitigation Project three different landslide locations were selected for mitigation.

1. Badulusirigama/ UvaWellassa University premises in Badulla District, Uva Province
2. Alagumale in Matale District, Central Province
3. Udamadura in Nuwara Eliya District, Central Province

The JICA experts who are working at NBRO Head Office have completed the designs. Financial and technical assistance of this project is given by the Japan International Cooperation Agency. The implementation of proposed mitigation measures is now in progress in the following sites and expected to be completed by 2016.

Climate Resilience Improvement Program (World Bank Funded)

Component 2 Building Climate Resilience Infrastructure (2014 – 2016)

This program is implemented by the Ministry of Irrigation and Water Resource Management and the technical inputs for landslide mitigation are provided by NBRO.

Sub-component – School Protection (US$ 7.0Mn)

This component implemented by NBRO covers slope stabilisation and drainage improvements of 18 selected schools in Kandy District. NBRO has completed investigations and design of work for Darmaraja, Mahamaya, Hillwood and Gothami Vidyalaya and the estimated cost of the work is LKR 336.69 Mn.

Subcomponent - Transport Continuity (US$ 26.0 Mn)

This project covers improvements and stabilisation of unstable slopes in

1. Kandy – Mahiyangana Road (18 locations)
2. Awissawella- Hatton Road (1 location)
3. Beragala – Wellawaya Road (2 locations)
4. Kegalle – Bulathkohupitiya Road (1 location)

NBRO has so far completed work under Mahiyangana – Kandy road for which the estimated value of work is LKR. 548.52 Mn.

Symposia and Conferences

NBRO ANNUAL SYMPOSIUM

The NBRO 6th Annual Symposium of 2016 was held under the theme 'Innovations for Resilient Environment' on 22nd December 2015 from 8.30 a.m. to 4.15 p.m. at the Auditorium of Ministry of Disaster Management, Vidya Mawatha, Colombo 07.

Prof. Ajith De Alwis Project Director, COSTI delivered the key note speech whereas Mr. S. S. Miyanawala, Secretary to the Disaster Management addressed the audience at the Inaugural session. The symposium had three technical sessions under the subthemes of Guiding towards resilient development; Engineering innovation and Best practices, which were chaired by Plnr. Archt. Veranjan Kurukulasuriya, Director General, NPPD, Dr. Gamini Jayathissa, Senior Scientist, NBRO and Prof. Ranjith Dissanayake, Head, Dep. Of Civil Engineering, University of Peradeniya. At the end of symposium, professional discussion was carried and chaired by Eng. (Dr.) AsiriKarunawardena, Director General, NBRO and panellists consisted with Plnr. Arct. Veranjan Kurukulasoriya, Director General, NPPD, Prof. Ranjith Dissanayake, Head, Dep. of Civil Engineering, University of Peradeniya, and Mr. RMS Bandara, Director, Landslide Research & Risk Management Division, NBRO.

SEMINARS AND WORKSHOPS BY JICA – 2015

The resident JICA team of experts at NBRO together with staff of NBRO took an active role in arranging a series of seminars and workshops conducted by the Japan International Cooperation Agencyfor reviewing of Disaster Management Mechanism in Sri Lanka based on experience in Sri Lanka and Japan.

The workshops and seminars were held on 8th December 2015, 14th January 2016 and 25th January 2016 respectively where experts from Japan, Ms. N. Kitazawa, Mr. H. Hasegawa, Mr. M. Kunitomo from National Institute for Land and Infrastructure Management, Dr. Y. Ishii from Public Works Research Institute and Dr. Satoru Nishikawa, Executive Director of Research at Japan Centre for Area Development participated and made presentations.

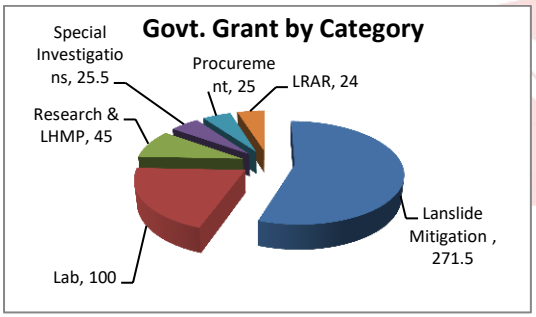
Financial Highlights

In 2015, NBRO recorded consolidated revenue of LKR 618.8 Mn. that reflects a growth of 48% over the previous year.

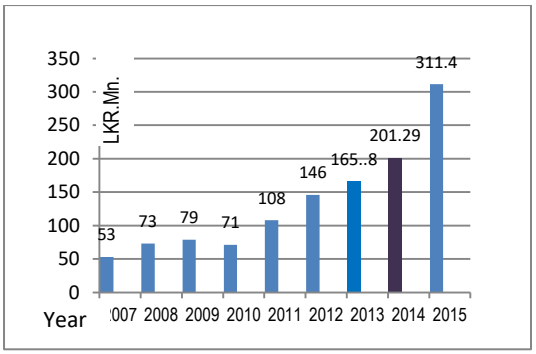
Revenue from customary NBRO services LKR 311.4 Mn. shows remarkable 54% growth in 2015. The institution depends mostly on this consultancy revenue generated to meet its recurrent expenditure.

LKR 271.5 Mn. has been received under government grant for mitigation of high risk landslides in 2015.

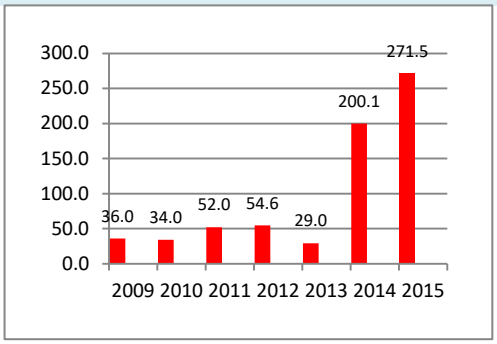
Nine district offices of NBRO have been functioning since March 2011 for issuance of Landslide Risk Assessment Reports for development work in landslide-prone districts. LKR 24.0 Mn. was provided by the Treasury as recurrent expenditure and the balance requirement was met with nominal fee charged from applicants and rest by NBRO revenue.



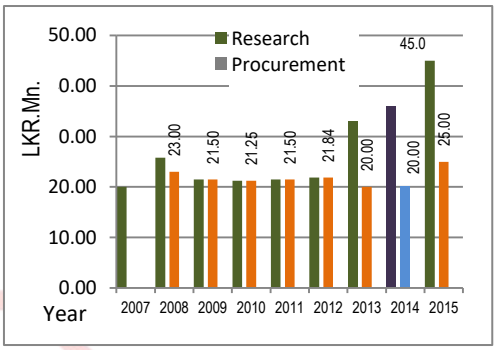
Government Grant by Category 2015



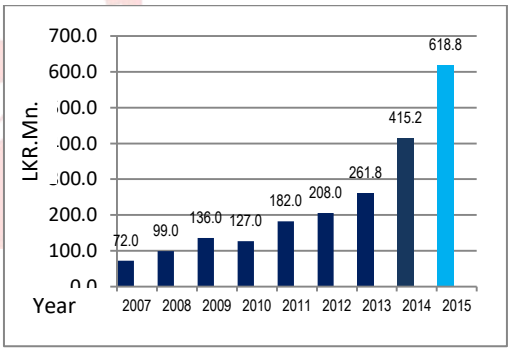
Income by Testing and Consultancy



Landslide mitigation budget



Research and Procurement Grant



Total Operating Revenue

In addition, Research Grant for Landslide Hazard Mapping of LKR 30.0Mn.together with LKR 15.0 Mn for the Research & Development was received. Grant for Landslide Special Investigations of LKR 25.5 was received including LKR 15.5 Mn. for the additional investigation due to extreme climatic events happened in Badulla and Nuwaraeliya districts in 2015. LKR 15.5 Mn. was reallocated by the Treasury from the Grant allocation for Landslide Mitigation Program 2015. Procurement Grant for lab & field, office equipment of LKR 25.00Mn.was received from the Treasury.

Year

The total operating revenue for year 2015 was LKR 618.8 Mn. while total operating expenditure for the corresponding period was LKR 565.3 Mn. A net profit of LKR 53.5 Mn. was recorded.

The expenses on personal emoluments for the staff strength of 347 plus daily paid employees was LKR 218.67 Mn. in 2015 as against the staff strength of 233 plus daily paid employees was LKR 160.2 Mn. in year 2014.

The institution growth and enhanced performance have been mainly due to the courageous effort of the management and the staff of NBRO.

Statement of Financial Position

STATEMENT OF FINANCIAL POSITION AS AT 31ST DECEMBER 2015				
		As at 31.12.2015 LKR		As at 31.12.2014 LKR
ASSETS				
Current Assets				
Cash and cash equivalents			277,251,451	153,524,050
Receivables	Project Debtors	15,598,652		
	Sundry Receivables	27,391,779	42,990,431	42,173,934
Inventories			1,921,018	1,649,724
Pre-payments				
	Festival Advance	79,250		189,000
	Travelling & Subsistence Advance	152,300		105,000
	Special Cash Advance	10,484		309,183
	Distress Loan	13,233,097		12,015,562
	MSC Loan	357,208		585,957
	Advances to Contractors	31,857,913		4,479,144
	Other Advances	370,679		239,480
	Other Pre-payments	7,130,221	53,191,152	3,025,962
Other Current Assets				
	Project work in progress	318,153,287		132,182,194
	Others	140,254,140	458,407,427	72,038,849
Non - Current Assets				
Infrastructure, Plant & Equipment		407,043,331		325,357,848
New Lab Building WIP		5,346,134	412,389,465	
Total Assets			**1,246,150,944**	**747,875,888**
LIABILITIES				
Current Liabilities				
Payables	Money Received from Clients	413,895,506		177,950,000
	Employee benefit payable	374,261		374,261
	Sundry payables	60,347,825		38,074,586
	Advance received from General Treasury	18,624,490		2,700,229
	Unrecognized Direct Credits	590,980	493,833,062	
Non – Current Liabilities				
Long term provisions				
	Provision for Depreciation	278,853,701		236,173,130
	Provision for Gratuity & Bad debtors	61,484,791	340,338,492	50,512,581
Total Liabilities			**834,171,554**	**505,784,787**
Net Assets			**411,979,390**	**242,091,101**
NET ASSETS / EQUITY				
Capital contributed by Government & Other entities		201,446,192		160,207,591
Reserves – Revaluation Surplus		27,875,989		27,875,989
Assets acquired		2,264,498	231,586,679	2,264,498
Accumulated Surplus/ (Deficit)				
	Surplus brought forward		126,844,722	(36,498,608)
	Transfer from Other Grants			25,493,260
Surplus for the year			53,547,989	62,748,371
Total Net Assets / Equity			**411,979,390**	**242,091,101**

Statement of Financial Performance

STATEMENT OF FINANCIAL PERFORMANCE FOR THE YEAR ENDED 31ST DECEMBER 2015			
	LKR		LKR
Description	**Year 2015**		**Year 2014**
REVENUE			
Fees, Fines, Penalties & Licenses		337,309	258,128
Other Revenue – Divisional net Consultancy Revenue			
Environment Studies & Services Division	11,395,912		3,833,570
Geo Technical Engineering & Testing Division	7,984,653		21,727,150
Landslide research & Risk Management Division	13,166,087		56,653,056
Human Settlements Planning & Training Division	1,586,738		1,448,448)
Building Material Division	23,226,756		6,392,039
Project Management Division	1,992,912		2,465,608
Road Project	17,093,864	76,446,922	-
Other income		14,877,413	5,699,258
Total Revenue		**91,661,644**	**95,580,361**
LESS:EXPENSES			
Salaries, Wages and Employee Benefits	39,766,682		29,317,505
Grants and Other Transfer payments	930,102		1,339,506
Supplies and Other Consumables used	20,095,603		15,619,260
Depreciation and Amortization	4,184,604		2,673,021
Impairments of Property ,Plant and Equipment	10,553,128		6,378,825
Finance Cost	385,021		213,899
Other Expenses	23,600,580		17,263,844
Gross Expenditure	**99,515,720**		**72,805,859**
Less: Gen. overheads allocated to divisions	-61,402,064		**-39,973,869**
Net Expenditure		38,113,656	**32,831,990**
SURPLUS FOR THE YEAR		**53,547,989**	**62,748,371**

Cash Flow Statement

CASH FLOW STATEMENT FOR THE YEAR ENDED

	31ST DECEMBER 2015	31ST DECEMBER 2014
Surplus / (Deficit) before Taxation	**53,547,989**	**62,748,371**
Adjustments		
Depreciation	4,180,189	3,283,391
Provision for Gratuity	2,605,656	10,661,427
Gratuity Payment	-4,266,856	-1,822,434
Provision Bad Debtors	34,481	58,168
unrealized Interest Income	-8,179,241	-4,772,712
Write off Sundry Receivable - 2011	-17,846,990	-10,500,000
Operating Surplus(Deficit)before working capital changes	**30,075,228**	**59,656,211**
Changes in working capital		
Decrease in Debtors	-816,496	-6,514,538
Decrease in Refundable Payments		-2,812,929
Decrease in Sundry receivable- Grants & Projects		10,352,800
Increase in Advances received	16,515,241	-5,898,875
Increase in Pre payments	-32,241,863	-1,123,453
Increase in Inventories	-271,294	-194,112
Increase in Working In Progress	-185,971,093	-114,516,025
Increase in Deposits	-68,215,291	-10,800,989
Items which are non-movement of cash	74,882,250	
Unused fund for research grant		2,700,229
Money Received from Client	235,945,506	177,950,000
Decrease in Sundry Creditors	22,273,239	50,000
Unutilized grant		
Increase in Accrued expenses		20,380,225
Decrease in Refundable Deposits		1,400,758
Net Cash flows from Operating Activities	**92,175,426**	**130,629,302**
Cash flows from Investing Activities		
Interest Income	8,251,341	4,772,712
Purchase of Fixed Assets	-15,699,367	-46,212,861
Net cash flow from Investment activities	**-7,448,025**	**-41,440,149**
Cash flows from Financing Activities		
Government Grant (Research & Procurement)	39,000,000	20,000,000
Other Grants (Rain gauges)	-	20,000,000
Cash flows from Financing Activities	**39,000,000**	**40,000,000**
Net change in Cash and Cash equivalents	123,727,401	129,189,153
Cash and cash equivalents beginning of the period	153,524,050	24,334,897
Cash and cash equivalents as at 31.12.2014	**277,251,451**	**153,524,050**

Notes to Accounts

1. Basis of Accounting.

Financial Statements have been prepared by Complying with generally accepted Accounting Principles, Fundamental assumptions, Public Sector Accounting Standards and Accounting Standards introduced by the Institute of Chartered Accountants from time to time and also by considering the followings.

(a) Going Concern

(b) Consistently Application of Accounting Policies.

(c) Revenue and expenses recognition on accrual basis.

(d) Disclosure to deviations to Standards

2. General Accounting Policies.

2.1 Depreciation Policies.

(a) Full depreciation is provided in the year of purchase and no depreciation is provided in the Year of disposal for all fixed assets.

(b) Fixed assets are depreciated on Straight Line basis using the following rates.

Fixed asset type	%
Buildings	2.5
Machinery and Lab Equipment	20.0
Furniture & Fitting	10.0
Vehicles	20.0
General Office Equipment	20.0
Drawing Office Equipment	10.0
Tools	50.0
Library Books	5.0
Fire Extinguishers	10.0

(c) Amortization for granted assets has been deducted from the carrying value of grants as stipulated in Sri Lanka Accounting Standards.

2.2 Valuation of Closing Stock

Materials utilized and closing stocks have been valued at cost.

2.3 Provision for Gratuity

Provision for gratuity is calculated in accordance with the Gratuity Act.

2.4 Provision for doubtful Debtors

A Provision has been made for doubtful debts on the basis of;

(a) 1 % Provision is made for debts outstanding over 2-10 years.

(b) 25 % Provision is made for debts outstanding over 10 years.

3. **Bad debts written off during the years.**

Aggregated unrecoverable sundry debtors of public sector have been written off during the year as follows.

Approval of IMC	Amount (Rs).
IMC 01-01/2015	6,800,000.00
IMC 01-01/2015	3,000,000.00
IMC 01-01/2015	3,411,229.02
Total	**13,211,229.02**

4. **Government Grants Received.**

Description	**For year 2015 Rs.**	**For year 2014 Rs.**
Grants for Procurement	25,000,000.00	20,000,000
Grants for Rain gauges (UNDP)		20,000,000
Grants for Research & Development	14,000,000.00	12,000,000
Total	**39,000,000.00**	**52,000,000**

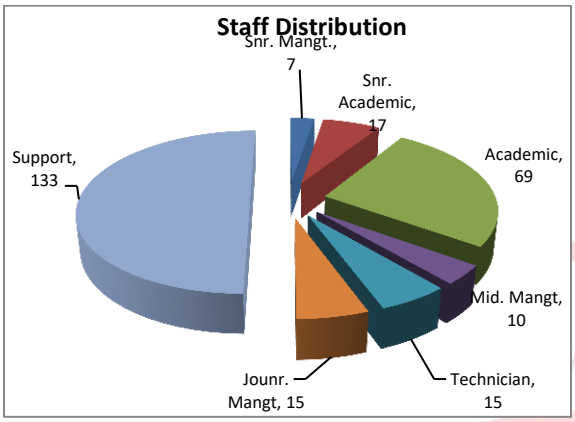
5. **Work in progress** (WIP) has been valued at percentage completed method as per the rates stated in th**e i**nitial estimates. The total WIP so recognized is Rs.318,153,287 (Schedule No 06)

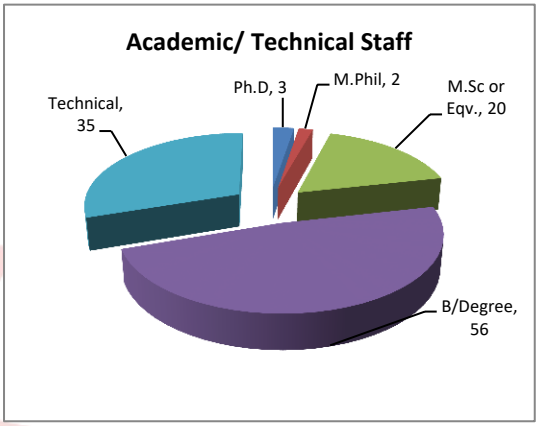
Money Received from client for the above projects is Rs.413,895,506.

Human Resource / Capacity Development

NBRO's Vision and Mission were set to develop its capacity to cater the Ministry's DRR needs. With this in view NBRO is in the process of legalizing the institution mission by an act and developing staff capacities to deliver high standard outputs. Staff turnover is one of the inherent issues of NBRO during the recent past. Human resource and infrastructure needs of the institution are becoming a matter of serious concern with the increasing responsibilities the institution shoulder at present.

Recruitment of new employees for essential vacant positions was done. By now, 55 employees in 6 categories have been recruited. A staff development program was initiated in 2013 and local and foreign training opportunities were widened and made available for our staff to enhance their experience and knowledge.





STAFF RECRUITMENTS/ RETIREMENTS/ RESIGNATIONS – 2015

No	Sal/ Code	Staff Category	No of Recruitment	No of Resignations	No. of Retirement
1	HM 1- 3	Senior Manager (CEO)	-	-	-
2	HM 1-1	Senior Manager	-	-	-
3	MM 1-1/JM 1-1	Middle/ Junior Management	5	-	-
4	AR2	Senior Academic/ Scientist	2	2	1
5	AR 1	Academic/ Scientist	22	1	-
6	MA 2-2	Management Assistant (Tech)	11	-	-
7	MA 1-2	Management Assistant (Non Tech)	6	-	1
8	PL 1,2&3	Primary	9	-	2
	TOTAL		**55**	**3**	**4**
				Total Cadre	

PROCUREMENT OF EQUIPMENT

The grant of LKR 20.0 Mn. given by the General Treasury to procure laboratory and field equipment for research for capacity building in NBRO was effectively utilized. Several major equipment including field accessories and important IT related equipment were procured under this grant. The key items are listed in the following table.

Division	Item
BMRTD	Compressometer, Energy Absorption Tester, Pullout Tester
ESSD	Vibration meter, Noise meter (2), Camera (2), GPS, Jar Test Apparatus, Hot Air Oven, Homogenizer
GETD	Ring shear Testing Machine, Tri-axial Testing Machine

STAFF TRAINING

NBRO sent its staff for training programmes both for local and foreign and in addition, encouraged some of the graduates to attend Master's degree programmes and facilitated their research projects by providing laboratory facilities and data.

BUILDING RENOVATION

NBRO in the past few years faced difficulties of having its laboratories housed in old buildings in which the working space was unacceptably inadequate. Existing buildings were renovated as much as permitted and plans are now underway to demolish the unusable buildings and construct a new laboratory complex.

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கணக்காய்வாளர் தலைமை அதிபதி திணைக்களம்
AUDITOR GENERAL'S DEPARTMENT

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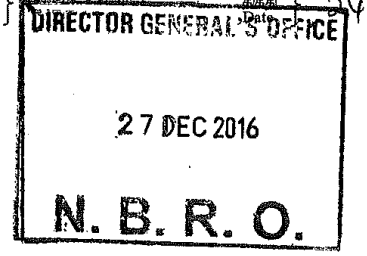

The Director General
National Building Research Organization

Report of the Auditor General on the Financial Statements of the National Building Research Organization for the year ended 31 December 2015 in terms of Section 14(2)(c) of the Finance Act, No. 38 of 1971.

The English version of the above mentioned report together with the audited financial statements is sent herewith.

H.M. Gamini Wijesinghe
Auditor General

D/C Internal Audit for Director.

Copies to: - 1. Secretary, Ministry of Disaster Management

2. Secretary, Ministry of Finance

M. Jayakody
pl arrange a meeting to discuss the report.

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கணக்காய்வாளர் தலைமை அதிபதி திணைக்களம்
AUDITOR GENERAL'S DEPARTMENT

මගේ අංකය எனது இல. My No. DMG/A/NBRO/1/15 /08 ඔබේ අංකය உமது இல. Your No.

දිනය திகதி Date 24 December 2016

The Director General
National Building Research Organization

Report of the Auditor General on the Financial Statements of the National Building Research Organization for the year ended 31 December 2015 in terms of Section 14(2)(c) of the Finance Act, No. 38 of 1971.

The audit of financial statements of the National Building Research Organization for the year ended 31 December 2015 comprising the statement of financial position as at 31 December 2015 and the statement of financial performance, statement of changes in net assets and cash flow statement for the year then ended and a statement of significant accounting policies and other explanatory information was carried out under my direction in pursuance of provisions in Article 154(1) of the Constitution of the Democratic Socialist Republic of Sri Lanka read in conjunction with Section 13(1) of the Finance Act, No. 38 of 1971. My comments and observations which I consider should be published with the Annual Report of the Organization in terms of Section 14 (2) (c) of the Finance Act appear in this report. A detailed report in terms of Section 13(7) (a) of the Finance Act will be issued to the Director General in due course.

1.2 **Management Responsibilities for the Financial Statements**

Management is responsible for the preparation and fair presentation of these financial statements in accordance with Sri Lanka Public Sector Accounting Standards and for such internal controls as the management determines is necessary to enable the preparation of financial statements that are free from material misstatements whether due to fraud or error.

1.3. **Auditor's Responsibility**

My responsibility is to express an opinion on these financial statements based on my audit. I conducted my audit in accordance with Sri Lanka Auditing Standards consistent with International Standards of Supreme Audit Institutions (ISSAI 1000 – 1810). Those Standards

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require that I comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatements.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Organization's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Organization's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements. Sub - sections (3) and (4) of the Section 13 of the Finance Act, No. 38 of 1971 give discretionary powers to the Auditor General to determine the scope and extent of the Audit.

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

Basis for Qualified Opinion

My opinion is qualified based on the matters described in paragraph 2.2 of this report.

Financial Statements

Qualified Opinion

In my opinion except for the effects of the matters described in paragraph 2.2 of this report, the financial statements give a true and fair view of the financial position of the National Building Research Organization as at 31 December 2015 and its financial performance and cash flows for the year then ended in accordance with Sri Lanka Public Sector Accounting Standards.

2. 2 Comments on Financial Statements

2.2.1 Compliance with Sri Lanka Public Sector Accounting Standards (SLPSAS)

The following observations are made.

(a) **SLPSAS, 01 – Presentation of Financial Statements:** The net operating results of 06 Divisions of the Organization had been shown as revenue in the statement of financial performance, instead of being shown the income and expenditure of every Division separately as per the provisions in the Standard.

(b) **SLPSAS, 07 – Property, Plant and Equipment:** According to the provisions in the Standard the depreciations for plant, property and equipment should be provided based on the date of procurement of such assets. However, according to the policy of the Organization, the provision for depreciation had been provided for the whole year of purchase of such assets and no provisions made for the year of disposal.

2.2.2 Accounting Deficiencies

The following accounting deficiencies were observed.

(a) A sum of Rs 1.44 million had been capitalized as a construction cost of a building constructed for the new Headquarters of the Organization which was not directly attributable for the construction works.

(b) Income received on consultancy services provided for the Department of Motor Traffic amounting to Rs 1.66 million had been erroneously treated as income of the Head Office instead of being shown under the income of Environment Studies and Services Division.

(c) A sum of Rs.17.85 million had been written off as bad debts during the year under review with the concurrence of the General Treasury and treated as expenses of the Landslide Research Risk Management Division instead of treating as an expenditure of the Head Office.

2.2.4 Lack of Documentary Evidence

As a practice, the Organization includes a profit / overhead margin in the cost estimates prepared for the projects implemented on mitigation of landslide risks, consultancy works etc. out of the proceeds received from the General Treasury. However, the details of profit/ overhead margin charged for each project had not been made available for audit. The Director General of the Organization had explained that the over head expenses on quantity estimation, preparation of tender documents and awarding, work supervision, checking of compliance etc, are charged by the Organization based on the standard fee scales for projects which adopted by professional bodies and it is depended according to the nature of the mitigation activity.

2.3 Non- Compliance with Laws, Rules and Regulations

The following instances of non- compliance were observed.

(a) It was observed that overtime amounting to Rs 3.99 million had been paid to 124 officers who were not entitled for such allowance in terms of Section 4.1 of the Chapter VIII of the Establishment Code of the Democratic Socialist Republic of Sri Lanka. According to the Director General, the Organization is running with the scarcity of the staff members with specialized knowledge in the fields of building construction, testing of building materials, water, air, soil and especially on landslides. Therefore, the Organization had made arrangements to pay overtime allowances to the staff officers as well to minimize the staff turnover and encourage them to attain the targets of the Organization which need to fulfill urgently.

(b) A sum of Rs 1.14 million had been paid during the year under review as holiday pay allowance for the staff grade officer who worked in public holidays. However, the approval of the Secretary to the line Ministry had not been obtained as required by the Public Administration Circular No 21/2013 of 13 October 2013. Further, 03 officers who were not entitled to obtain transport facilities from residence to office had enjoyed transport facilities up to September 2015, contrary to the provisions made in the Public Enterprises Circular No. PED/1/2015 of 26 May 2015.

(c) The officer who participated in the workshop held from 04 October to 12 December 2015 in Japan had obtained an incidental allowance of Rs 171,444 even though the Institute which organized the workshop had incurred all the costs related to the foreign tour, in contrary to the paragraph 3.2 of the Department of Public Finance Circular No.01/2015/01 of 15 May 2015.

3. Financial Review

3.1 Financial Results

According to the financial statements presented, the operations of the Organization for the year under review had resulted in a surplus of Rs.53.55 million as compared with the corresponding surplus Rs.62.75 million in the previous year, thus indicating a deterioration of Rs.9.20 million in the financial results of the year under review as compared with the previous year. Increase of operational expenses by Rs.5.28 million and decrease of revenue by Rs.3.92 million during the year under review as compared with the previous year were the main reasons attributed for this deterioration.

However, the above mentioned operating results for the year under review and the previous year had been in a favorable position of Rs.288.19 million and Rs 250.97 million respectively after adding the remunerations, depreciation and taxes paid to the Government aggregating Rs.234.64 million and Rs.188.20 million for the year under review and the previous year respectively.

4. Operating Review

4.1 Performance

The main objective of the Organization is to minimize the risks on disaster and promotion of research and development activities by providing technical support for the purpose of secured environment. The matters observed in audit on achievement of this objective by the Organization during the year under review are given below.

(a) Issue of Landslide Risk Assessment Reports

According to the information made available for audit, the Landslide Risk Assessment Reports should be obtained directly from the Organization or through the respective Local Authorities by the parties who expected to construct buildings in the landslide

risk areas, before the commencement of development activities. For that purpose, offices had been established by the Organization in 10 Districts which are vulnerable to landslide risks. A sum of Rs.38.6 million including the Treasury grants of Rs 24 million had been earned during the year under review through issuing such assessment reports.

The following observations are made in this connection.

(i) Out of the total amount of Rs. 3.51 million to be recovered from the Pradeshiya Sabhas on issue of the above mentioned reports, a sum of Rs. 1.07 million had not been recovered even as at 31 December 2015, thus indicating that the mechanism established to recover the dues from Pradeshiya Sabhas in timely manner had not been properly implemented .

(ii) According to the information received, the programme for issuing reports and approvals for the construction and developments in the landslide risk areas had been commenced in the year 2011 and since then 45,563 applications had been received up to the end of the year under review. Out of that 42,775 applications had only been approved. However, an effective course of actions had not been taken by the Organization to follow up the constructions made on rejected applications. As explained by the Director General, the Organization has no authority to stop any unauthorized construction or to take any legal action against defaulting parties, whereas the concerned local government body has the authority to do so. However, the Organization had taken steps to mark the sites of rejected applications in the hazard maps and maintain a register of rejected applications

(b) <u>Activities on Mitigation of Landslide Risks</u>

The following observations are made.

(i) <u>Gerandiella Landslide Risk Mitigation Project</u>

The activities such as rescue of 50 houses facing high risk of landslides, earth filling and construction of a dam to divert debris flowing to some other area and reconstruction of several main roads, etc. had been scheduled to be implemented under this Project. The activities of the Project had been commenced in 2012

and expected to be completed in 2015. Even though according to the initial estimate the works costing Rs.93.01 million were expected to be carried out during the year under review, the works at a cost of Rs.35.50 million only were carried out during the year under review and out of that works valued at Rs.11.90 million had only been completed as at the end of the year under review. Further, it was observed that the District Secretary of Nuwara-eliya had made a request on 09 November 2015 to expedite the construction works under the mitigation project. As explained by the Director General of the Organization, as the site is situated in a high rainfall area with unexpected geographical variances, the construction of drain system showed delays. During the mitigation period the site were subject to ground movements and as a result, designs, construction schedules and cost estimation thereon were changed. However, it is expected to complete the mitigation works by the end of August 2016.

(ii) Pessionwatte Landslide Mitigation Project

The mitigation works under the above Project had been continued from 2014 and the first stage of the Project had been completed in July 2015. The second stage of the Project agreed to be completed on 31 January 2016 had not been completed even as at 30 June 2016. The Director General had explained that the Stage II of the Project had shown a slow progress as a result of unfavorable climatic condition prevailed in the area, barriers in transportation of machineries, material and shortages of labour force.

(c) Landslide Mitigation Projects implemented in Schools

The construction works at Watukanda MahaVidyalaya, Udagampitiya Maha Vidyalaya, Ovitigama Maha Vidyalaya and Vijitha Maha Vidyalaya at Dikwella had not been completed even as the at the end of the year under review, out of the construction works for landslide mitigations expected to be completed in 14 schools. In addition to that the Organization had entered into an agreement to provide consultancy services on landslide mitigation activities of another 18 schools in Kandy District under the Climate Resilience Improvement Project implemented by the Ministry of

Irrigation and Water Resources Management. Out of that the construction works of 04 schools under 02 contract packages had been commenced during the year under review whilst consultancy services including selection of contractors and bid evaluation etc. had remained incomplete even as at 31 December 2015.

(d) **Climate Resilience Improvement**

The Organization had entered into an agreement to provide consultancy services on landslide mitigation activities of unstable slopes in 16 sections of Kandy – Mahiyangana Road. According to the information received, the physical progress of the several sections of the Road was remained only at 4.2 per cent whereas the expected target was 75 per cent and the works to be completed as at 31 December 2015.

4.2 Contract Administration

The following observations are made.

(a) Action had been taken during the year under review to construct the Headquarters building for the Organization at an estimated cost of Rs 350 million and out of that the capital grant amounting to Rs. 100 million had been received during the year under review from the General Treasury. The following observations are made in this connection.

(i) Even though the estimated cost for the construction was Rs 350 million, a Cabinet Approved Procurement Committee and Technical Evaluation Committee had not been appointed as required by Guideline 2.14.1 of the Government Procurement Guidelines. Instead, a contract had been awarded on 29 December 2015 for the piling works at a cost of Rs. 45.28 million under the approval of a Procurement Committee appointed by the Secretary of the line Ministry.

(ii) It was observed that the piling works commenced on 29 March 2016 had not been completed even as at 30 June 2016. The mobilization advance amounting to Rs.8.12 million had been paid on 30 December 2015 without entering into an agreement with the contractor. It was further observed that the mobilization

advance had remained unsettled for over 03 months due to not commencement of piling works.

(b) It was observed that the procedure applied for the disposal of 03 motor vehicles of the Organization was not carried out in transparent manner as the valuation of such vehicles had been done by the external party and inadequate period of 08 days only had been granted to submit the bids.

4.3 Human Resources Management

Even though 35 persons for the posts of Scientists had been recruited during the year under review to fill the vacancies prevailed as at the end of the previous year, 31 persons had been still deployed under contract and assignment basis without the approval of the Department of Management Services.

5. Accountability and Good Governance

5.1 Establishment of the National Building Research Organization

This Organization had been established under the decision of the Cabinet of Ministers dated 29 September 1993, in order to establish a separate institution to perform the functions vested to some other institutions such as Building Research Institute, State Engineering Corporation and Soil Research Laboratory of the Department of Buildings etc. As the Organization was not incorporated under an Act of Parliament, the validity of the certificates issued by the Organization for construction purposes was remained questionable. Further, the opportunities on follow up action to be taken by the Organization against the persons involved in constructions activities in the risky areas was very limited.

5.2 Action Plan

It was observed that the Annual Action Plan of the Organization had been prepared to achieve only for the financial targets and not based on physical target expected to be achieved. Therefore, the physical performance in connection with mapping of disaster risk zones and construction works done etc.to minimize landslides could not be satisfactorily evaluated in audit.

5.3 Internal Audit

The Internal Audit Section of the Organization comprised with an officer and payments made to meet various functions carried out by the Organization, progress on achievement of the physical performance, etc. had not be examined by the Internal Audit Unit.

5.4 Matters of Contentious Nature

It was observed that the Organization had invested its surplus funds of Rs 149.24 million in fixed deposits, contrary to the provisions in the Section 11(b) of the Finance Act, No. 38 of 1971 and Department of Public Enterprises Circular No. PED 56 of 27 January 2011.

5.4 Budgetary Controls

Significant variances between the budgeted and actuals figures were observed in audit, thus indicating that an adequate attention had not been paid in determination of financial targets for the Budget and to meet income and expenditure targets. Therefore, the Budget had not been made use of as an effective instrument of management control.

6. Systems and Controls

Weaknesses in systems and controls observed during the course of audit were brought to the notice of the Director General in time to time. Special attention of the management is needed in respect of the following areas.

Area of Operations	General Weakness
(a) Control over Debtors	Follow-up actions on long outstanding balances
(b) Human Resources Management	Filling the vacancies in the key posts.
(c) Project Management	Implementation of Project activities without delays

H.M.Gamini Wijesinghe
Auditor General

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அனர்த்த முகாமைத்துவ அமைச்சு
Ministry of Disaster Management

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Director General
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தேசிய கட்டிட ஆராய்ச்சி நிறுவனம்
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Our Ref} NBRO/AD/2016/230 Your Ref } Date } 23.03.2017

Auditor General
Auditor General's Department
No.306/72, Polduwa Road
Battaramulla

Auditor General's report in terms of section 14(2)(c) of Finance Act, No.38 of 1971 for the year ended 31st December 2015

Answer for the Auditor General's report.

2.2 Comments on Financial Statements

2.2.1 Compliance with Sri Lanka Public Sector Accounting Standards(SLPSAS)

(a) NBRO initiated design of its 2104 Financial Statements to the 1st standard of the Public Sector Accounting standard with the concurrence of Assistant Auditor General and the Audit Superintendent. This format does not reflect the gross income and expenditure of NBRO.However, if Auditor General suggests changing the format or the content, NBRO will change according to the suggestions from the year 2016 with comparative figures for the year 2015.

(b) From the year of 1st Financial Statement of NBRO, full depreciation in the year of procurement and no depreciation in the year of disposal have been recognized consistently. Actions have been taken to depreciate based on the date of procurement from the year 2016.

2.2.2. Accounting Deficiencies

(a) This expenditure has been allocated under preliminary expenses of the Building Project. However as per the Auditor General's report, this expenditure charged as an expenditure Accounts for the year 2016.

(c) The Income received for consultancy work done for the RMV project by the Environment division has been erroneously posted as an income for consultancy work of Environment Head Office. However, this error does not affect to the overall income of NBRO or divisional income.

(d) A sum of Rs. 17.85 Million off bad debts of Landslide Research Risk Management Division has been written of during the year 2015. This amount of bad debts has been charged to Landslide Research &Risk Management Division since the bad debts written off were relevant only to Landslide Research Risk Management Division.

2.2.4 Lack of Documentary Evidence

In General Treasury funded projects implemented by NBRO, the institution also has some main work components such as investigations, surveying, designing, and related project management works such as quantity estimation, preparation of tender documents and awarding, work supervision, checking of compliance etc. NBRO usually retains a fee for this work calculated according to standard fee scales for projects, prepared by professional bodies, to cover the

institutional expenditure including the overheads. NBRO does not claim profits separately as such from treasury funded projects, and if NBRO gains any profits at all that will be gained from the fee claimed through lowering the expenditure.

2.3 Non-Compliance with Laws, Rules and Regulations

(a) NBRO is a technical consultancy provider in the fields of building, building materials, water, air, soil and especially on landslides with a specialized technical staff. To achieve the NBRO targets and as well as the national requirements, NBRO needs to retain a qualified and experienced technical staff to deploy as needed. Currently there is a scarcity of said experts and NBRO had to launch strategies to minimize the turnover of staff officers. NBRO is a self-funded Public Sector Organization and in order to achieve the above objectives, the staff officers were paid overtime with the approval of IMC and it is not required to abide 100% to the Establishment Code and public administration circulars as per the circular PED-40.

(b) As per the explanation given by 2.3(a), it was necessary for officers to work extra days to achieve the targets of NBRO. Therefore, Holiday work payment for staff grade officers was made as per the delegation of authority to Director General granted by Interim Management Committee. NBRO currently operates staff group transport facility.

(c) Incidental allowances of Rs.171, 444 have been paid for the participant for a workshop to meet expenses which were not covered by the allowance given by JICA.

3. Financial Review

3.1 Financial Results

NBRO as a public sector organization dedicated to provide remedies for disaster mitigation activities was actively providing solutions for the prevailing hazard mitigation needs. This resulted in deploying staff, extra working hours and utilizing resources more into such activities in the year under review and as these activities increased NBRO expenses and they did not generate revenue to NBRO. However such activities were necessary and carried out as corporate social responsibility of NBRO. The increase in salary was an additional cause for the increase in expenditure. Hence the surplus in 2015 was lesser than that of previous year.

4. Operating Review

4.1 Performance

(a) Issue of Landslide Risk Assessment Reports

(i) As per the existing mechanism for issuance of landslide risk assessment report, when the fees are paid to the local authorities NBRO takes action promptly to issue the reports as this is considered as an important duty and an urgent measure. The collected fees are remitted to NBRO subsequently after retaining 10% of the value of work done by the concerned local government body, as directed by the General treasury. When reconciling it is noted that delays for the remittance occur and, in which case letters reminding the remittance are sent.

(ii) National Building Research Organisation does not have authority to stop any unauthorized construction or to take any legal action against defaulting parties, whereas the concerned local government body has the authority to do so. Hence,

NBRO does notinfluencedirectly in such matters. However, NBRO has taken necessary steps to mark the sites of rejected applications in the hazard maps and maintain a register of rejected applications. This is done to support further actions if deemed necessary.

(b) Activities on Mitigation of Landslide Risks

(i) Gerandiella Landslide Risk Mitigation Project

Gerandiella Landslide risk Mitigation project started in the year 2012. As a site is situated in a high rainfall area and due to unexpected geographical variances, the construction of drain system showed an accumulated delay. During the mitigation period the site were subject to ground movements because of which changes in the design and construction schedules were resulted. This caused delay in project implementation. However, by utilizing the balance fund of Rs.23Mn, NBRO expects to complete the project by end of August 2016.

(ii) Passianwatta Landslide Mitigation Project

Stage II of Passionwatta mitigation project has been planned for completion by 31.01.2016. However, due to following unexpected incidents faced by the contractor the scheduled targets were delayed.

- Unexpected heavy rain.
- Impossibility of work during rainy days
- Threat to the communities living below the sites at the time of heavy rain.
- Sliding of the banks and repairs needed for corrections.
- Impossibility of material transportation due to muddy roads. As a result it was impossible to remove soil.
- As machines could not reach the site, contractor had to implement Labor intensive work procedures instead of machine intensive work procedures.
- NBRO has completed the stage II by end of August 2016.

(c) Landslide Mitigation Projects Implemented in School

Most of the construction works at Watukanda mv, Udagampitiya mv, Ovitigamamv and Vijitha mv have been completed by now. Of the 10 sites started in 2015 work in four schools has been completed and work in other sites are now in progress. Further, NBRO entered in to an agreement with Ministry of Irrigation and Water Resource Management to provide consultancy service. This agreement continues up to 31st December 2017.Out of 18 schools, construction for mitigation has been started in 5 schools; evaluation of tender is being done for one school, and tenders have been prepared for six schools. The design work is in progress for the balance six schools.

(d) Climate Resilience Improvement.

NBRO has entered into an agreement to provide consultancy service on mitigation activities of unstable slopes of 18 sections of Kandy-Mahiyangana road of which progress as at 31st of December 2015 is as follows.

Number of slopes	Package No.	% of Progress
06	307	4.2
07	305	70
08	306	59

The design component of some sections of the consultancy agreement had to be redesignedas a result of the collapse of unstable slopesfollowing unexpected heavy rainfall. This resulted changes in the BOQ.As per the present situation package of 305 is almost complete, and 306 and 307 are about 70% complete. With favorable weather, work in all three packages will be completed before the end of this year.

4.2. Contract Administration

(a) (i) In the year 2015 National Budget Department approved the estimate prepared by NBRO for construction of proposed expansion of laboratory of NBRO for Rs.350 Mn, excluding consultancy component as NBRO is in a position to contribute its professional inputs towards the project.General Treasury approved to release funds during a period of three years and NBRO decided to plan the work accordingly.

Further, NBRO did not attempt to award the whole contract to a one contractor, since NBRO has realized the main contractor will award some works to subcontractors such as pilling work and with a view to remove inter contractor's margins. The whole project is divided into stages which enabled quick procurement, maintain a healthy cash flow and to save funds.
As this building is a model building with green concepts we had to change plans appropriately. This caused an unavoidable delay.

(ii) NBRO awarded the pilling works to a piling contractor and paid a mobilization advance upon an advance bond. NBRO has entered to an agreement with the pilling contractor and signed the agreement on submission of performance bond.

(b) A technical evaluation committee was appointed by Director General of NBRO to evaluate the disposal of unusable five vehicles in NBRO. This was advertised in public News Papers and the tender has been awarded to the highest bidders. None of the bidders had purchased the vehicles and bids were not secured by a deposit. As observed by TEC same bidders quoted for all vehiclesin different ranks. Therefore it was realized that calling for second lowest will not be fruitful to sell the vehicles and as a result, it was decided to retender with a bid security. In this instancetwo vehicles for which bid prices were above the valuation prices were sold without much difficulty. But for the other three vehicles quoted prices were lower than the previous valuation amounts.Thenthese three vehicles were revalued by a committee comprising of a member from Motor Traffic department, a member from Vocational Training Commission who is a Mechanical Engineer and other two members from NBRO. Since the bid prices of subsequent tender were higher than the revalued amounts with the recommendation of TEC and with the approval of tender board all three vehicles were sold to the highest bidders.

4.3 Human Resources Management

The Scheme of Recruitment of the National Building Research Organisation was approved on 17/03/2015 according to the Management Services CircularNo.30,and then it was revised on 19/11/2015 for allowing a cadre provision for 84 scientists. At the beginning of the year under review there were 33 scientistsunder permanent cadre and 35 more were recruited during the year under review. Out of the 31 officers deployed under assignment basis, 15 were recruited later on permanent basis on 18/01/2016. The other 16 scientists are deployed on assignment basis for special projects, out of which 6 were assigned to landslide mitigation-200Mn project ; 6 were assigned to CRIP project, and the balance were assigned to Dam Safety project and RMV project.

5. Accountability and Good Governance

5.1 Establishment of the National Building Research Organisation

It is reported that the National Building Research Organisation has no powers vested on it to stop unauthorized building construction or development activity or to take legal action and hence, NBRO cannot directly intervene on such matters. NBRO at times of such matters brought onto its notice, will endeavor forwarding all such matters to other institutions with legal authority to take action.

Actions have been taken to establish National Building Research Organisation by a parliamentary act and to have necessary legal authority vested in it.

5.2 Action Plan

Both Financial progress and physical progress are given in the annual action plan. However we expect to improve the presentation as per the observations of the auditthat will enable easy monitoring of the physical progress of Hazard Zonation Mapping work and landslide mitigation etc.

5.3 Internal Audit

According to the present organization setup, provision is provided only for one internal auditor. At the moment NBRO has one internal auditor. As the present workload demands employment of one to twoassistants, actions will be taken to revise the cadre and recruit accordingly to strengthen the internal audit.

5.4 Matters of Contentious Nature

Fixed deposits to the value of Rs 149.24 million were deposited in Peoples Bank. Approval of Treasury has been taken now from the General Treasury for Rs. 65 million which represents the Gratuity Provision and another 45 million Fixed deposit remains in Peoples Bank again as Bank Guarantees. The Balance Fixed deposits have been withdrawn by now.

5.4 Budgetary Control

In year under review there is no such significant variance between the budgeted figures and actuals. However steps will be taken to use the budget as an effective instrument of financial control and improvements will be made to lower the variance further.

6 Systems and Control

Actions have been taken to improve and strengthen the Systems and Control for making the management of the Organisation more efficient, while taking into consideration the audit queries raised from time to time on the following domains.

(a) Accounting
(b) Debtors Control
(c) Personnel Administration
(d) Project Management
(e) Budgetary Control

Further, we are pleased to report that, actions have been taken to pay more attention to the Systems and Controls and have them improved.

Eng. (Dr.) Asiri Karunawardena
Director General
National Building Research Organisation

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