Creating a masterpiece Using Appropriate building technologies

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National Institute of Rural Development and Panchayat Raj
Hyderabad

Creating a masterpiece…
Using appropriate building technologies

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Narendra Singh Tomar

सत्यमेव जयते

Union Minister
Ministry of Rural evelopment
Government of India

MESSAGE

I am very pleased to note the efforts made by the National Institute of Rural Development and Panchayati Raj (NIRD&PR) in promoting appropriate and environment friendly construction technologies as a part of its mandate in the sphere of rural development and promoting sustainable development goals in rural areas of the Country. These construction technologies use locally available and sustainable building materials that are eco-friendly, cost-effective and energy-efficient.

In the series of efforts being taken up for promoting the housing sector at NIRD&PR, I am happy to note that the Director General's bungalow has been constructed by using these construction technologies. Such path breaking efforts are very valuable steps in mainstreaming these technologies in the Construction Industry. By adopting these technologies, we can realise the goal of 'housing for all' at an affordable cost. These eco-friendly housing technologies can also provide better comfort and prevent the environmental degradation due to usage of conventional construction technologies and energy intensive materials.

This building constructed at NIRD&PR, with the help of Padmasri G Shankar of Habitat Technology Group, Trivandrum is surely a notable attempt towards incorporating appropriate construction technologies. I am sure this book which portrays the beauty of cost effective and sustainable construction technologies, will serve as a guide for the housing practitioners and people who are especially engaged in the Rural housing programmes across the country. I wish the NIRD&PR, all success in their endeavour of sustainable rural development in the Country.

Sri Narendra Singh Tomar
Union Minister for Rural Development
Government of India

अमरजीत सिन्हा
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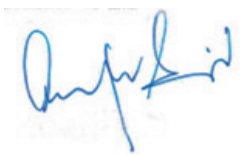
MESSAGE

I am happy to learn that National Institute of Rural Development and Panchayati Raj (NIRD&PR), is unveiling the book titled '*Creating a masterpiece - using appropriate building technologies*'. I am sure that the book will inspire many other institutions and people to adopt such appropriate and sustainable construction technologies.

I wish the NIRD&PR all success in their endeavour for enabling sustainable rural development in the Country.



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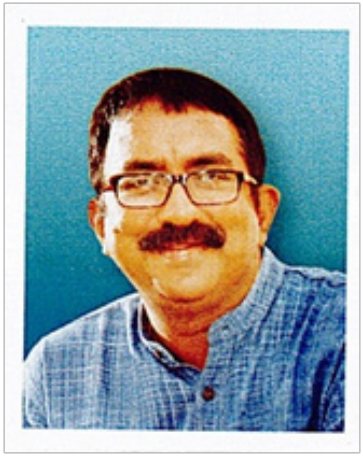

FOREWORD

Habitat Technology Group has been associated with National Institute of Rural Development and Panchayati Raj for the last one and a half decades in various capacities.

Habitat was a key partner for the setting up of Rural Technology Park. The park that showcases cost effective and eco sensitive technology from various parts of the country has attracted a large no of bureaucrats, people's representatives and professionals over the years. The park is a pioneering landmark in the promotion of sustainable technologies in India.

Later, we also had the privilege of winning a national competition for preparation of the NIRD's campus master plan.

I understand that one of the mandates of NIRD is to promote people centered approaches leading to sustainability. Dr WR Reddy, the present DG was magnanimous enough to give me the opportunity to design the Director General's official residence using appropriate technologies. Opinion leaders from across the country would visit, so the idea was for them to see and experience the building and take the message forward.

Right from the design stage to execution, we have followed the norms of sustainability religiously. DG's residence is probably one of the first earth building in the public domain in this part of the country. The design and technology details are explained in this book.

The present time needs this kind of interventions to be replicated and spread across the country.

It is also an occasion to say how grateful I am to Dr WR Reddy, Dr Ramesh, Er BN Mani and the entire NIRD team who remains very supportive.

G.SHANKAR
Padmashri Awardee (2011)
Chief Architect,
Habitat Technology Group
Trivandrum, Kerala

Director General
NIRD&PR

National Institute of
Rural Development and Panchayati Raj
(NIRD&PR)

PREFACE

Housing inadequacy is largely felt at the level of low income households and more so with continuous rise in cost of construction at all levels. This necessitates the use of appropriate, environment-friendly and cost-effective technologies in construction, which have not become popular yet and not adopted widely by people. Popularise them would include, inter-alia, creating more demonstration buildings, effective transfer of technology, training of artisans, production of elements, creating awareness, construction guidance etc.

India, even today, depicts the history of the building construction through wide variety of housing patterns, which provide an insight into the engineering genius and are a testimony of man's adaptability and harmony with nature.

The National Rural Building Centre (NRBC) has been created in the **Rural Technology Park (RTP)** of the NIRD, to demonstrate various cost-effective and appropriate technologies for the housing needs in different parts of the country, with a variety of local materials, with a blend the old and the new techniques of construction. NRBC projects the technologies that are aptly suitable for disaster prone locations, viz. earthquake, cyclone, fire etc; built utilizing the locally available resources and skills of the people. Their cost of construction will be in the range of 25% to 40% less than that of the cost of buildings built with conventional construction, varying as per the place, soil typology, local conditions and technologies adopted.

Inspired by the cost-effective and eco-friendly technologies, such as Laurie Baker's and the others', the Director General's Bungalow at NIRD&PR is built, using mostly the locally available materials and with a traditional touch of a mud house typology. Promotion of these technologies can give a great fillip, not only for accelerating provision of shelter for all, through **Pradhan Mantri Awas Yojana (PMAY)** and other schemes, but also attract the attention of those who splurge resources with highly negative environment effect and motivate them to adopt these technologies. It also aims at making a 'Bold Statement' in favour of these technologies for all to adopt, namely, Compressed Mud Blocks (CMB), Filler Slab roofing, Rat-trap Bond brick work, Mud Plastering, Tandoor/ Terracotta tile flooring, Bamboo railings/partitions, Pergolas, Rain water harvesting, Waste water treatment and recycling, Solar energy harvesting etc.

It has reduced the capital cost substantially but also will reduce the recurring cost through thermal comfort. Wide-spread adoption of these technologies across the Country can slow down the adverse climate change and its consequences.

Many have contributed to this marvellous building structure and the most important one has been Padmasri G Shankar, Habitat Technologies Group (HTG). The drawing, design and execution of the building has been done by HTG. The Bungalow has been constructed with great dedication and passionate effort of the team of Rural Technology Park of the NIRD&PR led by Dr Ramesh Sakthivel, Associate Professor and Mr B N Mani, Project Engineer, Centre for Innovations and Application of Technologies(CIAT). The Ministry of Rural Development, Government of India encouraged this innovative and bold initiative of NIRD&PR.

I am highly optimistic, hopeful and wish that this Coffee Table Book, narrating the grand success story of creation of this marvel, showcasing different cost-effective and appropriate housing technologies, will prove to be useful for all people, both rural and urban and solve the humongous housing problems in the Country and protect the environment.

Dr. WR Reddy
Director General
NIRD&PR

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Introduction

Housing Industry has received a big boost, in the recent times. There is a quantum jump in Housing Development with the contribution by all sectors and delivery groups. However, housing prices are going up beyond the limits of affordability for a common man as the cost of construction is rising up at a pace of 50%, which is even higher than the rate of inflation growth. Perticularly, the middle class people have become vulnerable due to the unaffordable cost of construction.

There is a way out though. In order to have a better and sustainable living, there is an option of adopting for strong, durable, functional, environment-friendly, ecologically appropriate, energy-efficient, yet cost-effective materials and also appropriate technologies in Construction business. Actually, that will be the future of this fast growing industry.

There are various Institutes and Bodies involved in Research and Development of building materials

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Back view from the garden

Residence of Director General NIRD-PR

National Institute of Rural Development and Panchayat Raj has been promoting use of appropriate building techniques for many years. For this, Rural Technology Park was specially created that showcases the age-old proven building technologies which are not only environment friendly and energy efficient, but also cost effective. Also, they give ethnic look which adds up to the aesthetics of the buildings.

These appropriate building techniques encourage the use of local materials thus, will provide plenty of livelihood options to the people in the surrounding areas.

NIRD-PR strongly believes that this is the future of the construction industry and hence we have taken of the task of popularizing these technologies through constructing more such buildings on the campus.

This is the first one in the series created in the form of DG's bungalow. It is indeed, a master-piece that will stand as a specimen, for people to see and replicate for sure in the future!!