

Using 3D construction printing

to reduce SA's housing backlog

The University of Johannesburg (UJ), in collaboration with the Department of Science and Innovation (DSI) and the KwaZulu-Natal Department of Human Settlements, recently built a low-cost house in only eight hours using 3D printing technology. This printed house is a first for South Africa and has the potential to improve the delivery of RDP houses in the country.

Think of the implications if the government can simply print low-cost housing for the poor in the same fashion as you print a picture at home.

Minister of Higher Education, Science, and Innovation, Dr Blade Nzimande, last year officially launched the 3D Construction Printing for Sustainable Human Settlements Project (3DCP) – a technology demonstration funded by the Department of Science and Innovation (DSI) and implemented by the University of Johannesburg (UJ) in partnership with the KwaZulu-Natal Department of Human Settlements.

Pioneered by the Roadmap for Science, Technology and Innovation (STI) to achieve sustainable smart, green and resilient settlements, the 3DCP's objectives are, among other things, to demonstrate its potential in improving housing delivery and to investigate the cost-benefit analysis of adopting the technology to help increase the speed of delivering houses.

Speaking during the launch of the project at the UJ Doornfontein campus, Minister Nzimande said that the 3DCP demonstrates the DSI's commitment to increasingly employ STI in addressing people's day-to-day challenges.

"Using innovative building products in South Africa has significant potential economic ramifications, including eradicating the housing backlog and providing better-quality housing and construction products, possibly reducing the life-cycle cost of the houses," said the Minister.

Provision of safe and quality housing is one of the most urgent challenges facing our country. Even though the government has made significant progress in the provision of housing in the past 28 years, the housing backlog still stands at more than 2.3 million houses.

"We believe that 3D construction printing will significantly alter and positively disrupt how human settlements will be delivered in South Africa," added the Minister.



Watch the launch and demonstration here: <https://www.youtube.com/watch?v=rfHdTJjQ0IU>

The 3D printing represents a novel technology in the manufacturing sector, which is associated with potentially strong stimuli for sustainable development. It encompasses additive means of production and its advantages in construction relate to lower costs, environmental friendliness, reduced fatalities and injuries on sites and reduced time of construction.

Other advantages of this project are that the cement used in 3D construction dries more quickly than the cement used in the construction sector, and that virtually any structure can be printed.

The KwaZulu-Natal Department of Human Settlements has committed to provide serviced sites for the demonstration and to building 10 houses in eThekweni Municipality, as well as to pilot the 3D construction printing of full-scale houses in the province, with an identified construction SMME to implement physical construction. UJ has made a piece of

land available on the campus to print a demo house while conducting training.

Nzimande added that this project will not pose a threat to the construction sector as there will still be workers needed to build the foundation and other elements of these houses.

Prof. Jeffrey Mahachi, Head of School: Civil Engineering & The Built Environment at UJ, stated that this printing process is not only fast but also cost effective.

"The interesting thing is you can print a house in 8 hours – I am assuming here that the foundation is done. The quality is excellent, and the product is cost effective," Mahachi said.

Article compiled from media releases issued by the Ministry of Higher Education, Science and Innovation, as well as the University of Johannesburg. For further information contact Thabang Sethare at Thabang.setlhare@dst.gov.za.

Univhesithi ya Joni hi ku tirhisana na ndzawulo ya Sayense na ndzawulo ya vutshwamo bya vanhu exifundzeni xa Kwazulu -Natala va a ke tindlu ta nxavo wa le hansi hi ti awara ta nhungu hi ki ku tirhisa vutekhnoloji byo tsala bya 3D construction. Tindlu to tsariwa hi tekhinoloji ya 3D i to sungula ku akiwa e Afrika-Dzonga na kona yin a matimba yo tlakusa ku akiwa ka tindlu ta ti RDP etikweni ra Afrika-Dzonga.

Translated into Tsonga by Dr Lean Makhubele.