

GOVERNMENT OF INDIA  
DEPARTMENT OF ATOMIC ENERGY  
**LOK SABHA**  
**UNSTARRED QUESTION NO.212**  
TO BE ANSWERED ON 09.07.2014

**THORIUM RESERVES**

212. SHRI HANSRAJ GANGARAM AHIR:

Will the PRIME MINISTER be pleased to state:

- (a) whether thorium reserves have been identified in various parts of the country;
- (b) if so, the details thereof;
- (c) whether the Government has launched any project for the mining of thorium and to make atomic energy from the same; and
- (d) if so, the details thereof?

**ANSWER**

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (DR. JITENDRA SINGH):

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- (a) Yes, Sir.
- (b) The Atomic Minerals Directorate for Exploration and Research (AMD), a constituent unit of Department of Atomic Energy (DAE), has so far established 11.93 million tonnes of monazite (Thorium bearing mineral) in the country, which contains about 1.07 million tonnes of thorium. The state-wise resources of *in situ* monazite established by AMD as on March 2014 are as follows:

State	Monazite (Million tonnes)
Odisha	2.41
Andhra Pradesh	3.72
Tamil Nadu	2.46
Kerala	1.90
West Bengal	1.22
Jharkhand	0.22
<b>Total</b>	<b>11.93</b>

- (c) Yes Sir.
- (d) (i) Monazite is the only commercially available mineral in India as a source of thorium. Monazite is found in the beach sands of coastal India.

Indian Rare Earths Limited (IREL), a Central Public Sector Undertaking wholly owned by the Government of India, under the administrative control of the Department of Atomic Energy is engaged in mining and mineral separation of beach sand minerals. IREL produces monazite in its plant at Manavalakurichi in Tamil Nadu, Chavara in Kerala and OSCOM in Odisha.

Indian Rare Earths Ltd has set up monazite processing plant at OSCOM, Odisha to process 10,000 tonnes of monazite per annum. Thorium is a by-product along with rare earth chloride and tri-sodium phosphate as main product from this plant.

- (ii) Bhabha Atomic Research Centre (BARC) and other research organisations attached with DAE are engaged in various R&D activities to address the utilisation of thorium in different types of reactors. Some important highlights of these activities are the following :

Thorium Oxide (Thoria) pellets contained in bundles have been used in the initial cores of our Pressurised Heavy Water Reactors (PHWRs). Thoria based fuels have also been irradiated in the research reactors CIRUS and Dhruva of BARC. After such irradiation these fuel elements have been examined in the laboratories at BARC, yielding excellent results.

The irradiated thoria pins of CIRUS have been reprocessed to obtain U233. The recovered uranium-233 has been fabricated as fuel for the 30 Kilo Watt (thermal) KAMINI reactor which is in operation at Indira Gandhi Centre for Atomic Research (IGCAR) at Kalpakkam.

The very challenging technologies for fabrication of Thoria based fuel pellets, carrying uranium-233, have been established.

A 300 MW Advanced Heavy Water Reactor (AHWR) using thorium based fuel has been designed and developed. This reactor will serve as a technology demonstrator for not only the thorium fuel cycle technologies, but also several advanced passive safety features. A Critical Facility was commissioned in 2008 at BARC, and is used for carrying out experiments to further validate the physics design features of AHWR. A project for launching construction of AHWR has been included in the XII plan.