GOVERNMENT OF INDIA
DEPARTMENT OF ATOMIC ENERGY
LOK SABHA
UNSTARRED QUESTION NO. 2830
TO BE ANSWERED ON 10.12.2014

THORIUM ASSETS

2830. DR. SANJAY JAISWAL:

Will the PRIME MINISTER be pleased to state:

(a) whether the Government has identified any new monazite sources during the last few years and if so, the details thereof; and

(b) the details of the policy of the Government to develop India's thorium assets as a viable energy source?

ANSWER

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

(a) Yes, sir. Atomic Minerals Directorate for Exploration and Research (AMD) a constituent unit of Department of Atomic Energy (DAE) has established 11.93 million tonnes of *in situ* resources of monazite as of October 2014 in the country, which contains about 1.07 million tonnes of thorium oxide (ThO_2). The recently identified monazite resources are in the States of Odisha (Brahmagiri, Jagatsinghpur and Kendrapara inland sediments), Andhra Pradesh (Amalapuam, Narsapur, Chirala), Kerala (Karimanal-Kazhakuttam, Kazhakuttam-Anjengo, Vypin-Munamba).

The state-wise resources of *in situ* monazite established by AMD (as of October 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
Total	11.93

(b) On account of physical characteristics of Thorium, it is not possible to build a nuclear reactor using Thorium alone. Thorium has to be converted to Uranium-233 in a reactor before it can be used as fuel. With this in view, a three-stage nuclear power programme, based on a closed nuclear fuel cycle has been chalked out. The three stage nuclear power programme aims to multiply the domestically available fissile resources through the use of natural Uranium in Pressurised Heavy Water Reactors, followed by use of Plutonium obtained from the spent fuel of Pressurised Heavy Water Reactors in Fast Breeder Reactors. Large scale use of Thorium will subsequently follow making use of Uranium-233 that will be bred in Fast Breeder Reactors, when adequate nuclear installed capacity in the country has been built.

The third stage of Indian nuclear power programme which contemplates making use of Uranium-233 to fuel Uranium-233 – Thorium based reactors, can provide energy independence to the country for several centuries.

Research & Development on Thorium utilisation has been a high priority of the Department of Atomic Energy (DAE) right since its inception. Today, India is regarded as the world leader in the field of Thorium technologies. Utilisation of Thorium based fuel has been done to a limited extent in research reactors as well as Pressurised Heavy Water Reactors (PHWRs). India is the only country in the world that is making use of Uranium-233 (obtained after irradiation of Thorium) in a reactor as a fuel. This reactor (30 Kw) named KAMINI is functioning since last 18 years.

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