Phase-II Ballistic Missile Defence (BMD) interceptor

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In news– Defence Research & Development Organisation (DRDO) conducted a **successful maiden flight-test of Phase-II BMD interceptor AD-1 missile** with a large kill altitude bracket from APJ Abdul Kalam Island off the coast of Odisha .

What is an AD-1 missile?

- **The AD-1 is a long-range interceptor missile designed for both low exo-atmospheric and endo-atmospheric interception** of long-range ballistic missiles as well as aircraft.
- It is propelled by a **two-stage solid motor** and equipped with an **indigenously-developed advanced control system, navigation** and guidance algorithm to precisely guide the vehicle to the target.
- AD-1 is a unique type of interceptor with advanced technologies available with a very few nations in the world.
- It is capable of intercepting incoming long-range nuclear missiles as well as slow-moving aircraft.

Phase-I of BMD-

- Development of Phase-I of the two-tier BMD, which is **designed to track and destroy nuclear missiles both inside (endo) and outside (exo) the earth's atmosphere** at altitudes from 15-25 km to 80-100 km for "a higher kill probability", was completed by DRDO some time ago.
- India, of course, has inducted the Russian S-400 Triumf surface-to-air missile systems that can detect, track and destroy incoming strategic bombers, jets, spy planes, drones and even some intermediate-range ballistic missiles.
- DRDO, on its part, is going ahead in developing the

requisite technologies for a full-fledged BMD system.

- As per the original plan, **Phase-I of the BMD system, with interceptors flying at 4.5 Mach supersonic speeds** to intercept enemy missiles, was meant **to tackle hostile missiles with a 2,000-km strike range**.
- **The Phase-II, in turn, is supposed to take on the 5,000-km range class of missiles.**
- **Only a few countries like the US, Russia, Israel and China have fully-operational BMD systems**, with an overlapping network of early-warning and tracking sensors, reliable command and control posts, land and sea-based batteries of advanced interceptor missiles.
- **India's BMD programme has been in the works since the late-1990s, with its first interceptor missile being tested in November 2006.**
- Having conducted over a dozen tests of the BMD system since then, a few of which have failed, DRDO in the past has said that it has a "kill probability of 99.8%" with the mix of exo and endo-interceptor missiles.
- AD-1 is a new and flexible endo-interceptor missile.