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EGYPT'S PARTICIPATION IN THE MVA PESC PROJECT: A REVIEW OF THE GAPS AND  
OPPORTUNITIES IN PAST AND FUTURE LUNAR MISSIONS

**Abstract**

Humanity is returning back to the Moon to establish a permanent and sustainable human-robotic presence on the lunar surface before the end of the decade. In addition to orbiters, landers, rovers, and crews, some nations aim to contribute to a more sophisticated and sustainable lunar architecture by building lunar bases. In this regard, The Moon Village Association is the only global organization that provides a platform and takes actions supporting communications and cooperation among all elements of the human society supporting the Moon Village concept, including both space-faring and non-space-faring countries and offers them the opportunity to play a role in its realization.

Over the past decade, Egypt has been making constitutional amendments to officially establish a national space agency and position space exploration as an integral part of Egyptian society. In 2019, Egypt officially established the Egyptian Space Agency (EgSA) and drafted a high-level national space strategy for 2030, one of which is to explore deep-space. Egypt's participation in the Moon Village Association (MVA) Participation of Emerging Space Countries (PESC) project complements these national efforts and interests to set more Specific, Measurable, Attainable, Relevant, and Timed goals and feasible milestones for its short-term, mid-term, and long-term objectives from a project management perspective. This is all a reflection of Egypt's enthusiastic youth, positioning the nation as one of the leading emerging space countries to develop a domestically-built spacecraft to embark on the first Egyptian deep-space mission orbiting the Moon.

In this paper, the MVA-Egypt founding team focuses on highlighting Egypt's interests and capabilities by identifying the commercial, scientific, and technological gaps in the past as well as in the active and planned lunar missions and highlighting opportunities for Egypt and the scientific community. We present Egypt's lunar exploration roadmap and investigate the current potential opportunities in the industry.

To assess the gaps and opportunities, we tabulated the previous, on-going, and planned lunar orbiter missions based on several data points, such as mission, country/operator, launch date, cost, launch mass, Launch Vehicle (LV), lunar delivery Space Transportation System (STS), orbit, landing site, main objectives, main instruments, and resolutions.