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Space Economy - New models and economic approaches for private space ventures, with an emphasis on the needs of emerging space nations (3)

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THE CHALLENGES OF LOW-COST SMALL SATELLITES FOR SPACE SERVICES VENTURES IN THE DEVELOPING WORLD - A FOCUS ON AFRICA

Abstract

The new technologies (interlocking communication, low orbit positioning and reorbiting management, multitask integration, etc.) applied to small satellites have made them very appealing from the economic point of view, centered on a sizeable reduction of payload weight, and therefore of construction, launch and operation costs. A corresponding big wave of launches started a few years ago and it's still going on (Planet, Starlink, OneWeb, Huawei, other initiatives under preparation); the relative TLC, EO, NAV services are already on the global market at competitive prices, although the business is still too "young" to evaluate what the real stable turnover will be like. There are in fact many controversies which might in the long run affect the actual enthousiasm, like the increasing space debris and environmental risks, the highest amortment costs involved by shorter operational lifetimes, the average dependence on strong political or major corporate backing (with a certain degree of ensueing captiveness in the targetable markets) and finally the intrinsic risks incurred by any technological novelty at its inception.

This is why we decided to examine the opportunities of small satellites in contexts where the aforesaid uncertainties can be clearly overcome by enormous benefits, that is the Developing World and especially those Countries where services via space, at low costs, represent nowadays the only affordable solution to fill, and urgently, the digital divide, therefore stimulating a lasting socio-economic development. The focus is then on Africa, where the wide majority of the so called LDCs is located and, on the other hand, a great relative increase in the "mobile" web connection is nowadays registered. In particular, we will focus on the "investment readiness" level of african Countries, as by documented indexes, such as the space industry intensity, the presence of local specific education and skills, the maturity of political and cultural environments. This Country ranking is also supported by a continental analysis of the World Bank's Group amount of finalized ODA (Official Development Aid) in the space domain, including the core and extended "downstream". This latter aspect confirms the sectoral socio-economic dynamism of these Countries, and also positively mitigates one of the three – not strictly economic – issues that can undermine the long term successful perception of small satellite initiatives, as mentioned before (environmental, political and cultural, new technology risks), that is the political and cultural one. In fact, the authoritative recognition by the main IFIs (International Financial Institutions) of these Countries' Space evolution, is the best guarantee that a suitable playing field for private capital ventures exist, against distorsions which often derive from an uncontrolled bias at the political levels including the interests of large Corporations.

Finally, based upon an integrated model system for a fully privately financed (on a project financing

cash flow basis) multitask microsatellite "design to cost" - and environmentally conscious - initiative, the SHST (Sealike Horizon Space Tutor), we provide some data and figures, especially on potential turnovers of space business in the targeted areas. It is an interesting simulation, reiterated by the authors in the last years, which offers a "profitability" benchmark for potential capital and financial local and international investors in the multitask small satellite business. It is based on predictable uses of space services both at sea and on ground, by specific clusters of clients with their relative contents and pricing. Although the scheme participation is still open at all levels (main equity partner, associated bank, constructor, satellite operator, etc.), the role of provider of downstream TLC and attached space services seems the most attractive for locals.