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

Abstract

The new technological solutions (interlock communication, low orbit and re-orbit management, multi-task TLC, EO, NAV) applied nowadays to small satellites make them very competitive, basically because of the relative reduction in weight, and therefore their construction, launch and operation costs. A corresponding wave of launches started a few years ago and it's still on (Planet Labs, Starlink, OneWeb, Huawei, Samsung, etc.); the relative space services are currently reaching the global market, although the business is still too "young" to evaluate its real stable perspectives. This work will not study the many controversial issues on the table – which might in the long run downsize the actual enthusiasm, like the increase of space debris and environmental risks, the highest amortment costs involved by shorter operational lifetimes, their average dependence on strong political or major corporate backing (with a certain degree of ensuing captiveness in the markets) and finally the intrinsic risks incurred by any technological novelty.

We will try instead to examine the opportunities offered by small satellites in contexts where all of the said uncertainties are clearly exceeded by massive benefits, and namely in the Developing World. There, services via space, at low costs, represent in fact the only affordable and urgent solution to tackle the digital divide issue, therefore triggering lasting socio-economic development. The focus is on Africa, where the wide majority of LDCs is, and, on the other hand, where a great relative increase in the "mobile" web connection propension is registered. In particular, we will deal with the "investment readiness" of these Countries, by documented indexes, such as the space industry intensity, the presence of specific education and skills, the maturity of political and cultural environments. The derived Country ranking coherently matches the Country classification of the World Bank Group by intensity of finalized ODA (Official Development Aid) in the space domain, widely considered. Which, not only confirms the degree of sectoral socio-economic dynamism, but also mitigates one of the three – not strictly economic – issues that undermine the long term successful perception of small satellite initiatives, as mentioned before, the political and cultural one. In fact, the authoritative recognition by the main IFIs (International Financial Institutions) of the Countries' space evolution, is the best guarantee of a suitable playing field for private capital ventures, against distorsions often deriving from uncontrolled factors at the political, levels including the interests of the big Corporations.

Finally, applying an integrated (technical and financial) model system for a fully private "project financing" (cash flow based) multitask microsatellite initiative, the SHST (Sealike Horizon Space Tutor), we provide some data and figures, especially regarding potential turnovers of space business in the targeted areas. It is an useful simulation which keeps being reiterated by the authors in several works. It offers, a "profitability" benchmark for capital and financial international investors in the multitask small satellite business, based on predictable uses of space services both at sea and on ground, by specific clusters of clients with their relative pricing. Although the scheme participation is open at all levels (main equity partner, associated bank, constructor, satellite operator, etc.), what could presumably most attract a venturer is the role of local provider of low cost satcom connection plus space services. The SHST model

is also technically designed to mitigate the remaining issues in the long term perception of those ventures: the environmental effects, both in (eg space debris) in (eg space debris) and out of Space; the main technological pitfalls.