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Economic analysis of both actual and potential future benefits from space activities and applications to
nations and peoples. (3)

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

Abstract

New technologies (interlocking communication, low orbit/weight, multitask integration, etc.) applied to small satellites have strongly increased their economic appeal for both stakeholders and final users of the relative services (TLC, EO, NAV). The wave of launches started a few years ago is still growing (Planet, StarLink, OneWeb, Huawei, etc.) but it is not clear for how long, for it could instead stabilize under the effect of several accumulated braking factors: the clear rise of "debris" risk generated at upper stratosphere and LEO altitudes, an unforeseen surge in standard amortment costs due to the shorter lifetime of these spacecraft, and the intrinsic vulnerabilities of all new systems when under long lasting stress for the first time, and finally the "countermeasures" taken by the traditional Satellite, wave frequency and landline Competitors. Last but not least, let's consider the political aspect of Country "readiness" (institutional, technical, commercial), which emerges often as the main obstacle to overcome in opening new markets, along with the risk that this element, when poorly managed, may create bottlenecks instead of openings. These counterdictory considerations brought us, while studying our model (technical and financial) for the implementation of a small multitask satellite system, to locate its best theoretical market potential in contexts where the said uncertainties can be clearly offset by accountable benefits. That is the Developing Countries and especially those where low cost space services represent now, also for the natural local conditions, the only solution against the pressing pitfall of digital divide on the way to long lasting socio-economic development. Africa, hosting the large majority of LDCs, is therefore the focus, also because it is currently experiencing a very positive increase in the "mobile" web connection rate. In particular, having to test our model through continental scouting, we had to select the potential target Countries, which we did using two indexes: according to their "investment readiness" (Index1), based on indicators such as the space industry intensity, the educational offer and existing skills, the institutional maturity of the environment; according to the amount of space qualified (mainly downstream) ODA (Official Development Aid) local projects finalised with the World Bank Group (Index2). This second index, measuring the authoritative engagement of the main IFIs (Int.l, Financial Institutions) in our field, proves the good attitudes to harness political and cultural disturbances and obstacles on the national playground. We conclude our study with details of the said Model: its fully private (project financing) funding scheme, the main segmentation of its maritime and land users and the relative cash flow, prices and services structure, its main technical features (Atlantic coverage, design to cost methodology, environmental consciousness, TLC and EO features, etc.). The final matrix of the SHST (SeaLike Horizon Space Tutor) shows its rentability (NPV and IRR indexes) and encompasses a handy, adaptable tool for negotiations with venture capitalits and long term buyers.