Perspective
Volume 11:8, 2022

Journal of Telecommunication System and Management

ISSN: 2167-0919 Open Access

An Analysis of Wireless Communication Utilising High-Altitude Platforms for Greater Coverage and Capacity

Cintoinie Mark*

Department of Telecommunications, University of New York, New York, USA

Introduction

In rural or remote areas exploiting cellular radio spectrum with a recent International Telecommunication report showing that as of the population in, most of which are living in rural areas, do not have access to broadband, this focuses on the potential of using for wireless communication in rural communities as an alternative. Considering the typically low user densities in rural areas and the benefits of coverage maximization while ensuring harmless coexistence the possibility of extending the achievable wireless coverage from a. This takes into consideration the coexistence terrestrial systems using intelligent techniques to dynamically manage radio resources and mitigate interference. Studies have shown that efficient intelligent radio resource and topology management can mitigate inter-system interference and ensure coexistence with improved system performance. Potential techniques for coverage extension such as exploiting the communications are discussed.

Description

More than half of the world's population do not have access to as of according to a recent International Telecommunication without broadband access, with the majority living in rural and remote areas significantly large areas. On the other hand, the scenario, which is dominated by islands of coverage, presents a different coverage problem. While delivering broadband in rural areas will significantly increase broadband connectivity, the lack of broadband access in rural areas does not necessarily mean insufficient data capacity in the region. For instance, despite the cover of capacity available to through submarine cable landings, progressive distribution to rural areas still remains an issue. It was estimated that a were required to cover over all living in rural areas who are either grossly underserved or entirely unserved. According to estimation, and low user densities render terrestrial communication systems commercially unattractive in rural areas thus preventing extended coverage. Even in technologically advanced countries such as, only of the landmass has broadband coverage. Although unlike in, of the population have broadband access, some areas and population still lack access to wireless telecommunication services due to reasons including restrictions as a result of planning or local regulations. It is clear that wireless coverage problems persist mostly in rural areas. In these cases, the use of to deliver telecommunication services presents a commercially viable alternative.

The work in based on wireless telecommunication service provisioning from. The focus is on coverage extension and coexistence of and terrestrial systems with minimal intra-system and inter-system interference. Since a macrocell can potentially transmit up to a distance of, it is highly likely that some terrestrial infrastructure will exist within the service area of a. Hence, it is important to ensure coexistence between these systems. Considering the seemingly commercial unviability of terrestrial communications in rural areas due to the low return on investments resulting from low user density, present a compelling alternative are aeronautic platforms which are manned or unmanned, located conventionally between altitude and used for wireless applications. The advantages of over terrestrial wireless and satellite systems in addressing some wireless communication issues are highlighted in. offer some advantages over terrestrial systems due to their elevated look-angle and better propagation performance. The increasing optimism in is partly due to the possibility of the use of one platform for multiple applications and their potential for low cost, high availability wireless communications service provision over an extended area.

Due to the characteristically low user density in rural areas, optimal coverage is important for the balance between the cost of deployment. Majority of the previous and current projects such as the Japanese Stratospheric project and other studies consider a service area radius of approximately on the other hand focuses on coverage extension from in a heterogeneous network specifically to deal with wide area coverage beyond the 30km radius, especially in rural areas. The design and deployment of wireless communication systems in rural areas must address the need for large coverage, operation in varying geographic terrain, robustness, and ease of installation. In order to satisfy the large coverage requirement using terrestrial systems, extremely tall base station masts are needed with signals transmitted at significantly high power. Apart from regulatory requirements, the high cost of deployment of the terrestrial solution renders this unattractive. It is also important to consider that some rural areas are very remote from the nearest backhaul infrastructure or do not have grid-based power for the terrestrial system. The cost benefit of over terrestrial systems is properly captured by the studies in. It is estimated in that the cost of deployment, operation and annual maintenance of a microcell of radius amounts to approximately Considering an area is estimated to, which is quite significant. On the other hand, the estimated cost of deployment, operation and annual maintenance of a is approximately for unmanned solar planes and 34 million for unmanned airships as highlighted in. Obviously, the difference in cost of these two networks considering the same coverage area is significant.

It is important to note that these estimates are very simplistic and quite optimistic because macrocell coverages can be varied based on user density, which can potentially influence the estimation. In rural areas for example, a macrocell can have a radius of or over, which casts aspersion on the estimation. Nonetheless, it is obvious that delivering extended coverage from is vital for it to be economically viable. In summary, offer increased coverage at a reduced cost, ease of deployment, and the possibility of incremental deployment. These characteristics encapsulate the requirements of a rural wireless communication system as captured thus making a suitable solution for wireless communication in rural areas. also allow for contiguous coverage with less frequent handovers over a regional service area, potential capacity improvements and reduced roundtrip time, increased throughput, lower latency and improved link budget compared to satellites for communication service delivery can range from having just remote radio heads elevated to the stratospheric altitude to complete base stations . Whether it is better to have just a or a complete base station is dependent on the trade-off between payload weight, power consumption, and allowable service delay. Having a full base station on a can potentially reduce signal round-trip time thereby reducing delay as signals are fully processed in the while in, data is relayed to a processing station thereby increasing the and hence delay [1-5].

***Address for Correspondence:** Cintoinie Mark, Department of Telecommunications, University of New York, New York, USA, E-mail: mark563 @edu.in*

Date of Submission: 04 August, 2022, Manuscript No. Jtsm-22-79533; **Editor assigned:** 06 August, 2022, PreQC No. P-79533; **Reviewed:** 18 August, 2022, QC No. Q-79533; **Revised:** 22 August, 2022, Manuscript No. R-79533; **Published:** 29 August, 2022, DOI: 10.37421- 2167-0919.2022.11.338

Conclusion

One of the most fundamental issues confronting the delivery of wireless communications services from is the design and development of aeronautic platforms with the appropriate form factor capable of maintaining its station at stratospheric altitudes over a long duration, while carrying wireless communications payload with sufficient energy. Apart from this, some other challenges are faced in the development of appropriate wireless communication approaches and techniques such as cell. The upsurge in interest in based wireless communications is not unconnected from recent successes in aeronautic engineering of, which have resulted in the development of capable of maintaining their station at stratospheric altitudes. There are currently platforms like, which have achieved successful stratospheric flight, which show good promise. In the field of wireless communications, advancements are being witnessed in antenna design.

References

1. Ji, Shaoxiong, Shirui Pan, Erik Cambria and Pekka Marttinen, et al. "A survey on knowledge graphs: Representation, acquisition, and applications." *J Telecommun Syst Manage* 33 (2021): 494-514.
2. Al Ammary, Fawaz, Carolyn Sidoti, Dorry L. Segev and Macey L. Henderson. "Health care policy and regulatory challenges for adoption of telemedicine in kidney transplantation." *J Telecommun Syst Manage* 77 (2021) 773-776.
3. Chaurasiya, Prem Kumar, Vilas Warudkar and Siraj Ahmed. "Wind energy development and policy in India: A review." *J Telecommun Syst Manage* 24 (2019) 342-357.
4. Lew, Susie Q., and Neal Sikka. "Operationalizing telehealth for home dialysis patients in the United States." *J Telecommun Syst Manage* 74 (2019) 95-100.
5. Boudko, Svetlana, Peder Aursand and Habtamu Abie. "Evolutionary game for confidentiality in IoT-Enabled smart grids." *J Telecommun Syst Manage* 11 (2020): 582.

How to cite this article: Mark, Cintoinie. "An Analysis of Wireless Communication Utilising High-Altitude Platforms for Greater Coverage and Capacity." J Telecommun Syst Manage 11 (2022): 338.