Connecting the jungle and other remote parts of the world

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Credit: AI-generated image ([disclaimer](#))

With the use of affordable, low-tech femtocells, the EU TUCAN3G project is bringing 3G connection to the otherwise unconnected regions of the world.

The world is clearly mobile and well connected. Thanks to the massive

penetration of cellular telephony, wherever you go you're always just a call or a text away.

But there is one exception to this well-connected world: the truly isolated and rural areas, such as the Amazon jungle, which are often inhabited by small, low-income populations. Here, because of the costs to build classical access and backhaul infrastructures, the return on investment in such projects is nearly 1 000 times lower than what can be achieved in urban areas. As a result, cellular companies tend to overlook these [rural areas](#).

The problem, however, is these are the same places that are also in the most need of developmental aid and support – for which communication is crucial. To fill this void and to connect these otherwise unconnected regions, the EU-funded TUCAN3G project aims to introduce mobile telephony and data services into the world's most isolated and rural regions.

Simple, cheap yet powerful

The TUCAN3G solution utilises new wireless technologies to create access networks based on 3G femtocells. These femtocells, which resemble a wireless router, are essentially small, low-power cellular base stations that act as repeaters capable of boosting signals. According to project researchers, the advantage of using femtocells is that they work via solar energy, thus eliminating the need for costly energy infrastructures that are simply not feasible in remote areas. For instance, installing a classical access station could cost upwards of EUR 40 000, whereas a femtocell can be bought for just EUR 500. On top of this, femtocells are easy to install and can be maintained with a simple reconfiguration performed remotely.

Hello, the Amazon calling

To demonstrate the economic viability of this system, the TUCAN3G project set up a demonstration platform in a very remote part of the Amazon rainforest. The demonstration consisted of two platforms supplying 3G telephony to six villages along the banks of the Napo River, located the Balsapuerto region of the north-eastern Peruvian Amazon.

Using only small 3G femtocells installed in each village, locals were able to communicate with relatives, coordinate health care services and even negotiate the price of the crops they were selling. The costs for the voice over IP was a flat rate of around EUR 9 .00, plus the costs of the downloaded kB. Since the system has been in place, users are making an average 40 calls per day.

Towards universal connectivity

In addition to connecting remote villages, the project also convinced local governments to support the development of small, mobile rural operators connected to the Telefonica backbone, thus ensuring ongoing connectivity for the villagers. Furthermore, a South American development bank has committed over EUR 700 000 towards expanding the programme to another 15 villages.

But perhaps the project's biggest achievement is proving that the development of sustainable, long-term cellular solutions for remote villages with less than 250 residents is economically viable. When one considers the number of remote villages, not only in developing countries, but also across the developed world, the potential impact of the TUCAN3G project is huge. Soon, thanks to research such as this, universal connectivity could become a reality.