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## Digital innovation in rural areas. A vision for smart villages in Dropull

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### Abstract

*The rural areas in Albania are undergoing rapid demographic, social and economic changes concerning emigration, depopulation, population ageing, little use of agriculture, livestock, tourism potential, and marginalization due to market and service centralization and poor infrastructure. In the present condition of isolation and rural decay, the creation of an easy two-way connection between territory and the people can open up new opportunities to revitalize rural areas.*

*The crucial role of these networks is to collect community potentials, create partnerships and offer benefits to the rural community. In this sense, the use of innovative digital technologies can become an important instrument to develop virtual networking through which a smart multimedia interactive platform can provide information, knowledge sharing and interconnection among different sectors.*

*EU has already launched and promoted these concepts since 2017, through Smart Village initiative (European Commission, 2017), paying particular attention to the use of innovative digital technologies that create a new form of network cooperation beyond the village boundaries, involving the surrounding countryside and towns.*

*Smart village means effectively and efficiently services delivered to the residents and businesses to improve their economic, social and environmental conditions, in particular finding out solutions offered by digital technologies. Digital innovation based on computing, communication and information technologies can act as an accelerator exploiting the hidden potential in the area. In the case of the proposed smart villages in the Municipality of Dropull, the first step to developing virtual networks through digital tools that support smart development is to provide digital infrastructure, broadband internet and to build a rural digital hub. This multi-service hub structure will be located in Jorgucat village, the municipality center, and it will manage digital services that respond to local needs offering support and training for the community.*

*The aim is to create a network between the local community and other actors in different fields by facilitating the delivery of public services and offering new opportunities.*

*Based on community needs, the objective of this study is to create a fast network of information and exchange between the territory and its governance, which enables information sharing and resource access for the people and tourists. In order to create this network, different e-tools (apps.) can be used to support and facilitate the process, focusing on the following vulnerable sectors of this Municipality: 1. Access to e-health, education, training and other essential services 2. Online market and promotion of local products 3. Online booking service, promoting tourism, heritage and cultural activities 4. Mobility 5. Governance. These tools are considered as a catalyst for the proposed network, which serves to reactivate human, environmental and financial resources in these villages and improve the attractiveness and competitiveness of rural areas. Successful networking models and e-tools already used in EU "smart villages" will be introduced to understand the structure of the information system and management. This will constitute the basis for the development of specific networking models inherent to the particularities of the Dropull villages, which can be supported by e-tools.*

## Introduction

Due to political changes and economic disruption since the early 90's, a rural exodus has been triggered in Albania and is still persisting today. This exodus has caused massive rural depopulation and an increasing median age in the remaining inhabitants in the villages (fig. 1). From 24.000 inhabitants according to civil registration, only 7000 remain in the region. As a result, most of the rural areas in Albania are undergoing rapid demographic and social changes and economic decline.

The situation has become particularly extreme in the remote and mountainous regions, unlike the western lowland areas which gradually became the most populated area in the country. As a result of the emigration to Greece, the Dropull region, particularly the Greek community in the south, has suffered a decrease of population, a partial abandonment of agriculture and livestock activities, lack of education, and a reduction of public health facilities and services – drawbacks that trigger further emigratory fluxes. Moreover, poor infrastructure has created conditions of isolation and internal decay, resulting in aggravated the living conditions of the inhabitants.

In the last years, the rehabilitation of the national road SH4, part of the European Corridor 2C in South-Ovest Europe, which connects the north and south Albania and constitutes the south door to Greece, can be seen as an important infrastructure that provides access to the main cities and services to the entities located along these axes (Universiteti POLIS, Bashkia Dropull 2018). The industrial oriented

administrative units are stimulated by the physical connections, although it is not based on the local potentials and interchange. Secondly, agricultural production, present in all the region (fig.2), although declining, is still a potential to be recovered and used to attract markets and processing industries which are well-known for their quality and long-time tradition in the Dropull area. Due to the lack of an organized market, production is spontaneous and fails to cover even the needs of the locals, who get products from the city.

Agriculture can offer benefits also for tourism, considering the business models connected to agricultural production such as eco-tourism or agro-tourism. Dropull and the Jorgucat Center of Municipality in particular, thanks to the favorable geographical position, constitutes a potential touristic centrality in the cross-border region, between Gjirokastra and Ioannina in Greece, and two UNESCO protected centers (fig.3).

The region presents various natural and architectonical monuments, such as forest, castles, churches, monasteries, bridges, which can be part of touristic itineraries and activities. The traditional stone houses, on the other hand, can be used to accommodate tourist and eco-tourism services (fig. 4) Historical and natural monuments in the area are not mapped, there are no wayfinding signs, tracking itineraries or hiking trails, and there is no mobility system or organized guides.

Considering the conditions of a shrinking

**DEMOGRAPHIC PROFILE  
MUNICIPALITY DROPULL**

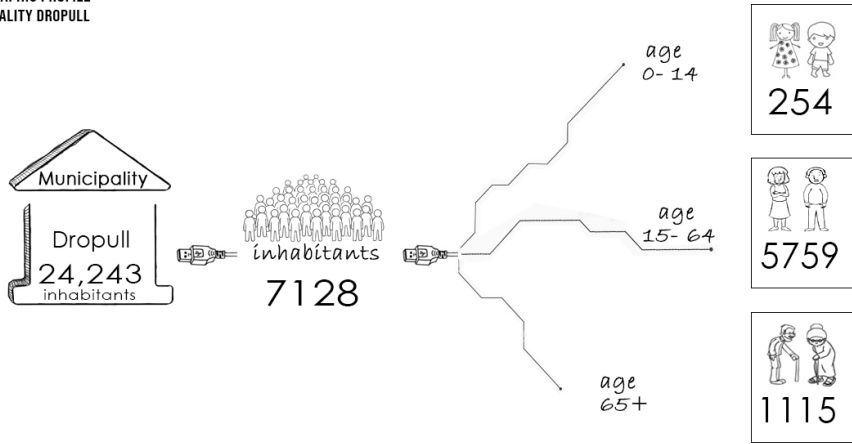


Fig.1 / Demographic profile of Dropull Municipality in 2015. Source / Rëmbeci 2018

**ECONOMIC PROFILE  
MUNICIPALITY DROPULL**

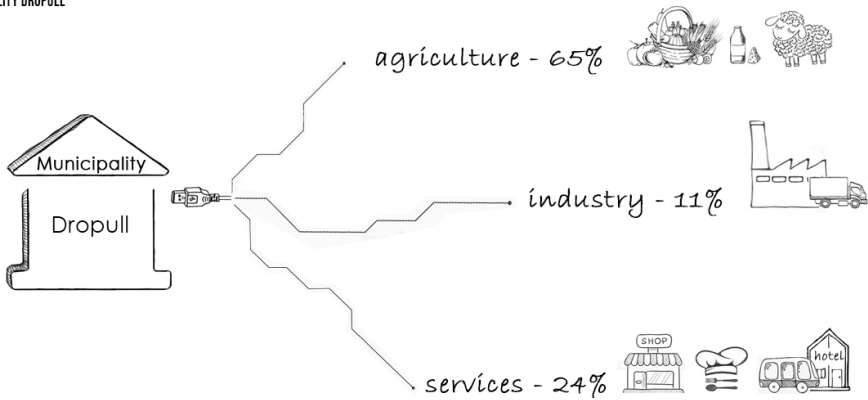


Fig.2 / Economic bases of Dropull Municipality, Region. Source / ISTAT Akademia e Studimeve Politike, 2016; Rëmbeci 2018

**MUNICIPALITY LOCATION  
SMART VILLAGE DROPULL**

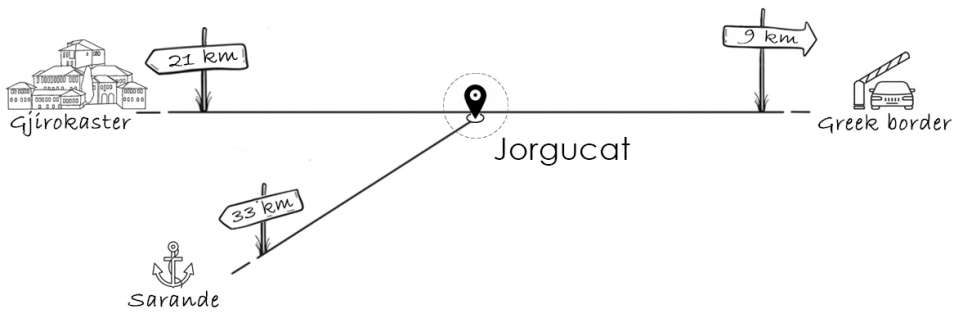
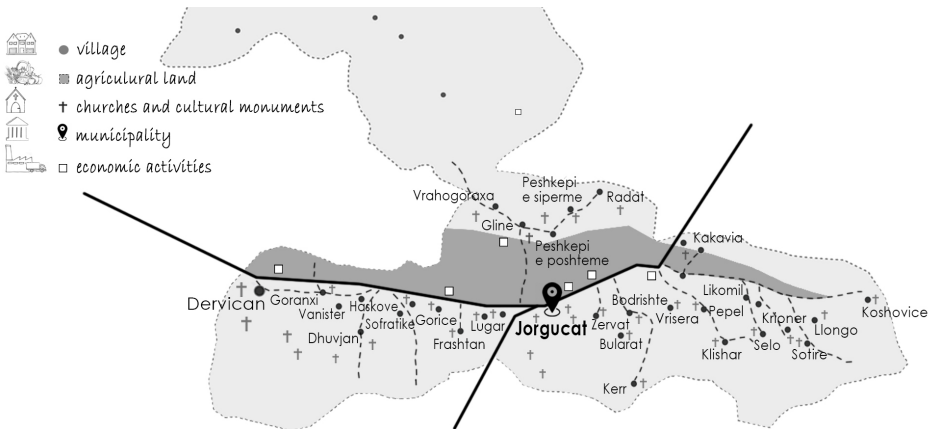


Fig.3 / Geographical position of Jorgucat, the center of Municipality of Dropulli Region. Source / the author



**MUNICIPALITY MAP OF DROPULL**

Fig.4 / Map of economic and touristic resources of Dropulli Region. Source / the author

rural region, with poor infrastructure and weak social and economic networks, and given the above-mentioned potentials, the use of innovative digital technologies can open up new opportunities to revitalize these rural areas by creating virtual networking through a smart multimedia interactive platform that provides information, knowledge sharing and interconnection in different sectors. Hence, such networking platform becomes a catalyst that enhances and drives initiatives, common engagements, local business opportunities and activities that enable rural villages to build on their social capital inherent in the community by ensuring territorial cohesion and improving access to services, while at the same time reducing the cost of service provisions.

### **Rural innovation through digitalization. EU initiatives.**

Digitalization is considered as an innovative tool that can create a new virtual dimension of spatial constructions in rural areas that enhance traditional networks and develop new networks and services to better serve community welfare. It consists not only in the access and use of (high speed) Internet and digital technologies, but also smart solutions based on the data collection and use that offer knowledge, manage resources efficiently starting from access to health, education, sharing economy, tourism promotion, mobility, governance and other community services (McLaren; Agyeman, 2015). These smart solutions were first used in "smart cities" applications developed to manage urban flows and foster collaborative digital environments that allow real-time responses. Through the use of this technology smart cities enable the connection between citizens, objects and utilities in order to significantly enhance the living conditions of environment.

An extensive literature survey about smart city definition and applications have been studied from twenty years ago (Qi, Shaofu, 2001; Giffinger (2007); Caraliu et al., 2011; Setis-Eu, 2012; Dameri, Cocchia, 2013). According to Giffinger (2007), one of the most-cited authors in the smart city field of study, there are six key aspects that define the smart city: smart living, smart governance, smart economy, smart mobility, smart environment, and smart people. Also, Frost & Sullivan (2014) also includes specific aspects of smart living such as smart energy, smart building, smart infrastructure, smart healthcare,

thus defining eight dimensions of the smart city.

These aspects would also create new opportunities for villages were they able to build upon their physical and human assets and potentials.

A smart village is a concept related to a bundle of services being delivered to a group of residents inhabiting that particular rural area and businesses, effectively and efficiently (Viswanadham, 2011). In the case of business and market, the interspatial dimension of smartness is very important to extend the network and knowledge sharing. Hence villages can be prepared to adequately respond to problems of marginalization, providing the best possible services offered by hyper-connectivity through the use of advanced technology.

The first ideas related to "Smart Villages" were presented in 2016 in the Cork Declaration (Cork, Ireland), named "A Better Life in Rural Areas" (European Conference on Rural Development, 2016). This declaration, which addressed some of the problematics of the rural areas related to shrinking population and youth drain, presented "boosting knowledge and innovation" as one of the main objectives of future policies. It specifically refers to "have access to appropriate technology, state-of-the-art connectivity, as well as new management tools to deliver economic, social and environmental benefits". In this sense, the declaration pushes forward the idea that villages should take advantage of the arising scientific and technological progress. Therefore, they sustain the importance of a Smart Villages agenda.

As a result in EU, Smart Village Initiatives were immediately launched by the European Parliament in 2017. In the same year, in the EU Action for Smart Villages, the European Commission defined smart villages as "rural areas and communities which build on their existing strengths and assets as well as on developing new opportunities", where "traditional and new networks and services are enhanced by means of digital, telecommunication technologies, innovations and the better use of knowledge".

Immediately after that, 'Smart Villages' was initiated as a subtheme within the European Network for Rural Development (ERND). European Network for Rural Development (ERND, 2018) considered five main aspects of smart villages: 1. People/ community 2. Digital technologies, 3. Inter-spatiality, 4. New

forms of cooperation and alliances, 5. Local assets.

In this regard the smart development of a village should be based on local people taking initiatives and proposing solutions to their needs based on local assets and aspirations, considering the territory as a whole and thinking about symbiotic connections in terms of physical, social and institutional forms of cooperation and alliances. The first step to think about the digital renovation in rural areas is to build up broadband infrastructures and take actions in social innovation, in order to tackle the digital divide between the urban and rural areas (European Commission, 2017).

Recently, in April 2018, Bled Declaration (Bled, Slovenia) proposed a series of actions to develop the rural economy by creating shared economy, virtual networks of food supply, rural tourism and offer various e-services through digital tools such as e-learning, e-administration, transport, gastronomy, etc. The above can be a starting point for agriculture and eco-tourism potentially based villages. This hyper-connectivity will improve people relationships with services, enhancing the economy and everyday life.

#### **Case study “Ludgate Hub” in Cork, Ireland**

A successful digital hub has been applied in Skibberee, a small rural town of 2700 inhabitants in Cork, Ireland. Skibberee, is the capital of West Cork, and the center for all the agricultural, industrial and tourist activities of the surrounding villages. Moreover, it offers a variety of services such as primary and secondary schools, health and recreational, activities. Just like the case of Dropull, this region is known for tourism, outdoor activities and artisan food (European Network for Rural Development, 2017).

“Ludgate Hub” installed for the first time 1GB of internet connectivity in a rural town in Ireland. This was the basic infrastructure for different smart application tools developed later. This project was initiated and partially founded by a group of entrepreneurs and private business owners and was developed based on a ‘bottom-up’ approach involving the local community since the early stages. Local business and service providers, retailers, teachers, farmers, students and local authority officials were invited since the first meetings to help in shaping the plan of the hub.

The hub was managed by two full-time staff and a board of 11 members skilled in project management, strategic planning,

building management, office design knowledge and to lead specific sectors they recruited specialist in education, retail, agriculture and other experts.

The main activities carried out by the hub were:

1. offering space and facilities for business such as training rooms, conference hall and video facilities.

2. networking activities and services for business. In particular, the hub created an e-commerce community portal ([www.estreet.ie](http://www.estreet.ie)), for the local retailer to gradually increase their online sales

3. digital educational for the local community to help them using email, shop online, use e-bank etc. and training services for young people to develop web sites.

4. Re-branding rural areas. Create websites working with the local chamber of commerce to brand the image of the rural area and encourage banks to help young people building startups in the area. Ludgate Hub is a successful example widely recognized at national and EU level for supporting the local businesses through E-Street e-commerce platform, which was an effective response to the economic cycle of decline that was taking place in this rural region.

#### **Case study: “Digital Villages” project in Germany**

“Digital villages” project in Germany is focused on the creation of a conventional digital platform for local goods supply, mobility and e-governance. The project gives a concrete solution via the application. One of this apps is BestellBar, where local vendors such as local bakeries, organic farms, vegetable farmer, but also nonfood vendors, such as sports stores, drugstores, pharmacies, laundries, book stores and libraries can sell products online. Likewise, product delivery is combined with the concept of the digital volunteer developed via another application LieferBar, used by locals to deliver goods from local merchants to other citizens (European Network for Rural Development, 2018).

This is an example of the large social impact that the culture of collaboration and shared services between residents and local business provide through an app.

#### **A vision for smart villages in Dropull region**

In the case of the shrinking villages in the Dropull region, considering its agricultural, industrial and tourism potentials, digital technologies can play a key role

in increasing the economic and social cohesion between the rural and urban areas, in revitalizing the rural services, in improving the quality of life of the inhabitants, in promoting a sustainable development, and in cutting off the cycle of decline and emigration.

After understanding the local needs given by the inhabitants during the field survey, the first step is to translate them in networking terms, which are inputs for the digital tools development. After the development of these tools in the Dropull region, it's essential to provide digital infrastructures, broadband internet and to build a rural digital hub. This multi-service hub structure will be located in the Jorgucat village, the center of the Municipality. It will manage digital services that respond to local needs by offering support and training for the community of Municipality of Dropull. This multi-hub will create a network between the local community and other customer actors of different fields such as local market, supermarkets, wholesalers, retailers, tourist etc. (fig. 5)

Why is Jorgucat an appropriate place to host a digital hub?

The village of Jorgucat is one of the biggest communities of the Dropull Municipality. With a population of 1550 inhabitants, it is the second after Dervican, which has a population of 2100 inhabitants. Jorgucat, where the offices of the Municipality are located, is a crossroad between Gjrokastër- Kakavi (Greek border) national road and the road to Saranda (access road to sea).

Another important reason why Jorgucat is considered as an important location to host the digital hub is the nearby presence of many industries such as Glina water, Pepsi Factory, herbs factory, Gjiofarma dairy products, furniture factory etc., which can play a key role in funding and supporting the project.

In addition, Jorgucat also accommodates various services which are missing in other villages, such as a doctor and a small sanitary center consisting in one room, a health center of orthodox church with basic medical device, a primary school, a post office, a police station.

The proposed hub will be located inside the exiting municipality building and will be managed by full-time staff. To drive a multi-services hub, you need to install a fast internet connection up to 100mb/s. Based on the community needs, different e-tools (apps.) can be developed focusing on sales, networking, multimedia and

information data.

The digital infrastructure and the e-tools applied in the case of Dropull, while similar to already tested cases in different European villages, has its peculiarities because it builds upon the most vulnerable sectors of the Municipality and the local needs proposed by the inhabitants. Accordingly, the primary areas to introduce digital networking are online market and eco-tourism (fig. 6). These also include services such as mobility, information mapping, e-governance etc.

One of the main potentials of this region is the development of eco/agro-tourism, because of the natural resources that this territory offers, the agricultural and gastronomic tradition which can lead to sustainable development, and the architectural heritage.

This is a rich territory with cultural heritage, historical churches, monasteries and other important monuments. Each village has stone houses which, even if poor and simple, it offers great potential to accommodate visitors for eco-tourism. Moreover, Jorgucat has space for various outdoor activities. In this regard, digital applications can provide an informative map on the historical and natural sites, including itineraries and a list of accommodation houses that facilitates wayfinding in the area.

Secondly, due to the lack of an organized transportation system, a mobility app can connect tourists with local people, who can offer taxi or guide service to facilitate the exploration of and transportation in the area. Moreover, it can also facilitate the finding of accommodation structures. Another important potential of the region is agriculture and farming developed in the field in front of the villages. According to INSTAT, 65% of the population works in this sector. The proposed network, in this case, is composed of two parts: the first to sell online products among the locals of different villages, and second, to find customers outside the village, by increasing the online visibility and opening to a new market. This approach will serve not only the organization and diversification the production but will also motivate farmers to increase their production.

This application will be connected to the multi-service hub, which manages via CRM technology the sales site and updates it with new data from the farmers when necessary.

This project can also be integrated with

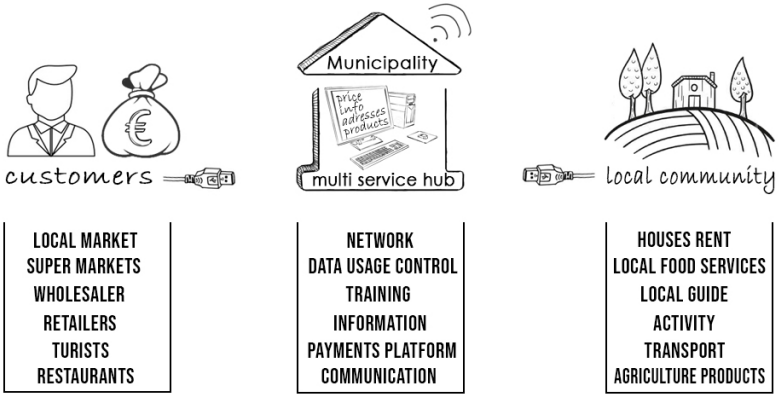


Fig.5 / Model of the digital network proposed in Dropull. Source / the author

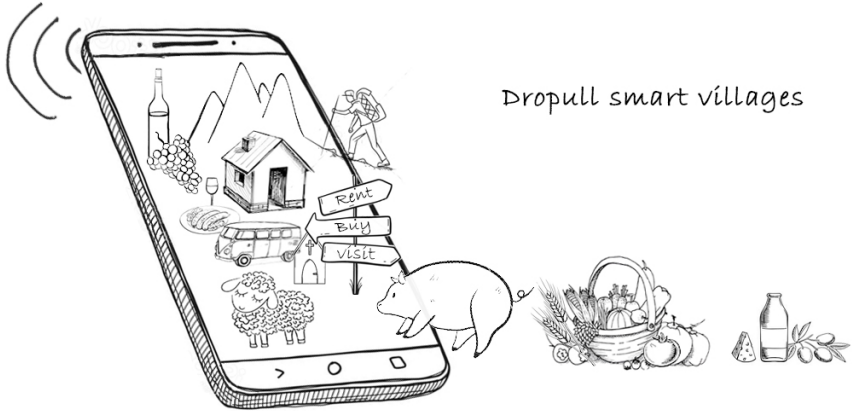


Fig.6 / Dropull smart village vision. Source / the author

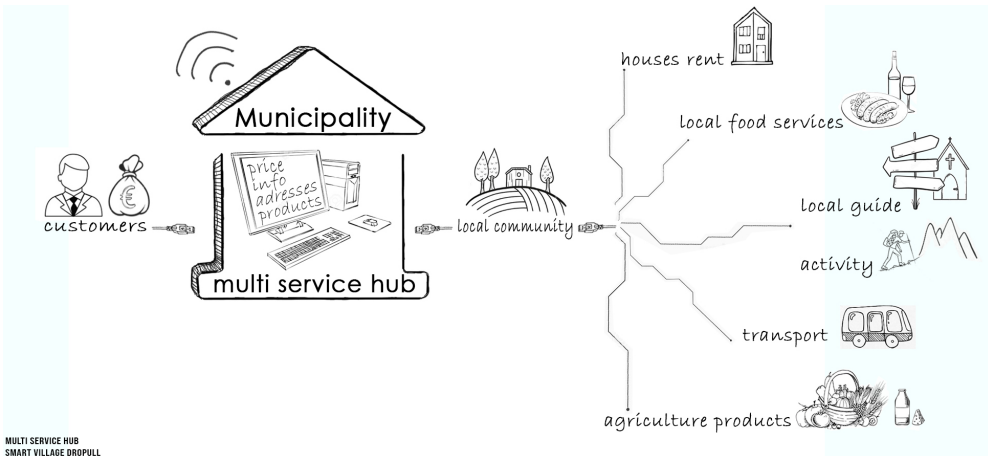


Fig.7 / Model of local community-hub communication in the case of Dropull. Source / the author

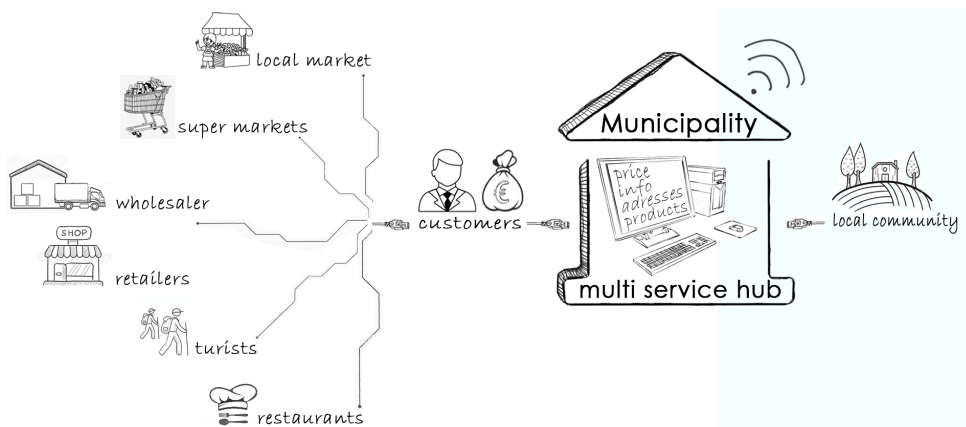


Fig.8 / Model of local customers-hub communication in the case of Dropull. Source / the author



the 'mobility' application used for tourists to move from one village to the other and to easily reach touristic spots. For the inhabitants of the village, it can work on "voluntary" based delivery service (fig. 7,8).

The main steps to follow in order to overcome the rural divide in the region of Dropull through digital innovation are:

1. To understand the rural context and identify local potentials and community needs, and build potential networks serving the community.
2. To create a development vision and plan the digital investment in the area (provide good internet connection between all villages to support future applications)
3. To collect data of all the resources and actors in the area such as (government, economy, and local's inhabitants)
4. To consider multi-sectorial services rather than single sectors separately.
5. To identify qualified people in the village to guarantee the performance of the project.
6. To consider the cost of the project and identify different potential funding sources such as public, private (related to local industries), and EU funding initiatives.

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