Working Document

New digital opportunities for rural areas
Community Broadband

September 2017

Abstract

Community investments in broadband infrastructure are crucial when commercial interests do not ensure that rural areas have appropriate fast and superfast ('next generation') broadband connectivity. Even, when public policies are in place to support rural broadband infrastructure, the involvement of the community brings considerable benefits.

This case study provides practical lessons from **two community broadband examples** in Europe: **North-Western Kuhmo Village Fibre Optic Network** (in Finland) and the **Molenwaard Community Broadband initiative** (in the Netherlands) to answer questions such as: '*What are the advantages of community broadband?'; 'What conditions are necessary to initiate community broadband projects?'*; and '*What are the practical steps for setting up broadband infrastructure through community involvement?'.*

* *See detailed description of the two case examples. Special thanks to Thematic Group members and experts Marieke Kok (the Molenwaard Broadband), Philip Donner and Petri Rinne (North-Western Kuhmo Network) for their support.*

1. Why community broadband & what is the role of the 'community'?

The **digital divide** between urban and rural areas is one of the main challenges that rural areas are facing today. On the one hand, the lack of appropriate fast and superfast ('next generation') broadband connection can considerably set back rural areas (compared to urban counterparts) in terms of responding to new opportunities and trends. On the other hand, appropriate broadband connectivity combined with other assets and potentials of rural areas (such as closeness to natural environment, cheaper housing and office spaces, etc.) can lead to 'multiplied' economic and social development in rural areas.

The basic principle behind setting-up community broadband networks, is that **community efforts and investments are needed in case commercial interests and public policies do not ensure that appropriate fast and superfast broadband networks are established in rural areas**. Community involvement can be made at different stages:

- ✓ Community members are the **initiators** of the project and members of the bodies set up to design and manage the project (e.g. cooperative or board).
- ✓ Community members often provide **voluntary work** at all stages (starting from planning and constructing the network to sustaining and animating broadband services).
- ✓ Community members are the main **subscribers** of the network, and as such, they need to be aware of the potential benefits of broadband connectivity for their lives.

The triggers for setting up fast and superfast rural broadband can vary according to the specific characteristics and needs of a rural area. In the case of North-Western Kuhmo Village Optical Fibre Cooperative (from now on referred to as Kuhmo Cooperative), the main trigger for setting up community broadband was to **overcome the disadvantages of remoteness** (including connecting Kuhmo's International Centre of Chamber Music with other leading schools and experts); in the case of Molenwaard Broadband the trigger was to provide the local community, households and enterprises **with appropriate connectivity**, since commercial interests did not lead to investments. One of the main incentives for setting up community broadband is **demand aggregation** (i.e. attracting a critical number of subscribers through community involvement).

2. The two case examples in a nutshell

This case study is based on two specific community broadband examples (see also detailed case examples) of North-Western Kuhmo Village Optic Fibre Cooperative (Kuhmo Cooperative) and Molenwaard Community Broadband (Molenwaard Broadband).

While there are several similarities between the two networks (e.g. the scale of fibre optic network in terms of length and number of villages engaged; the role of local initiators and the community, etc.) there are also considerable differences, in particular:

- While the Kuhmo Network was supported from public funding (EAFRD and national funding) and was realised in a favourable national policy-environment (Broadband for Everyone in Finland); no public funding has been available in the case of the Molenwaard Broadband.

- The Kuhmo network is already established and is currently facing more operational challenges, while the Molenwaard Network is still in the planning phase (currently in the process of identifying investors).

- The natural and demographic characteristics of the two areas are crucially different: in terms of natural barriers, the Molenwaard Network is facing considerable challenges of constructing fibre optic network in a boggy soil and dike system, which makes the (estimated) costs of construction more than 4 times more than that of Kuhmo. While the Netherlands is characterised by densely populated areas, the area of Kuhmo is quite the opposite making it more challenging to engage the critical number of broadband subscribers (while Kuhmo reached 200 households – 74% in 8 villages; the Molenwaard project reached 5345 households – 67% in 14 villages).

North-Western Kuhmo Village Optic Fibre Cooperative (Finland)

The project aimed at enhancing the quality of life, access to services and entrepreneurial and economic conditions in a sparsely populated countryside by offering fast internet connections based on optical fibre network. The target area was North-Western Kuhmo and its six villages in very sparsely populated Eastern Finland: Hietaperä, Iivantiira, Kuusamonkylä, Härmänkylä, Koskenmäki ja Vuosanka. The Village Cooperative initiated and has been actively engaged in the process, from needs assessment, through the physical setting up of the network, to awareness raising about the benefits of broadband connectivity.

Molenwaard Community Broadband

In many rural areas of Zuid-Holland there is no fast broadband available. In municipality Molenwaard the commercial parties provide fast broadband in only a few (more populated) villages. The rest of the villages are not 'attractive' from a commercial point of view for the providers, so for these households, fast broadband is not available. Therefore, in Molenwaard a group of citizens started an initiative to organise their own fast broadband network (owned by the civil society). The main purpose of the project was to provide access to a fast glass optical fibre network to the whole local community (including those living at the outskirts), entrepreneurs and households in the municipality of Molenwaard.

---

3. What are the main benefits of community broadband?

The **immediate results** of community broadband investments are that 'next generation' broadband connectivity becomes available for the wider rural community, i.e. local households, businesses and public services (including those that are in remote areas). However**, the longer-term impact** of community broadband may be much wider than this: among others, improved connectivity can lead to a diverse set of new activities and improved services from improved public services (e.g. social health care services) to new digital entrepreneurship[1]. The main results of community broadband networks can be summarised as follows:

✓ **New fibre optic network built.**

> The Kuhmo Network built 165 km of fibre optic network while the Molenwaard Network aims to build 158 km.

> The Kuhmo Network engaged 200 (74%) of households in 8 villages; and the Molenwaard Network already generated interest from 67% of the 5345 potential subscribers in 14 villages.

✓ **Access to new (rural) subscribers (individuals and businesses) to next generation broadband.**

✓ **Cost-effectiveness (including voluntary work) and responding to local needs.**

> Both projects are initiated in a bottom-up way based on real local needs. The bottom-up approach leads to strong community engagement (including voluntary work, worth 36,000 working hours in the case of the Kuhmo Network) as well as better penetration rate (i.e. number of subscribers) than those of top-down national programmes.

4. What conditions are needed to set up a rural digital hub?

Conditions that are necessary or beneficial for starting up a community broadband project:
- ✓ Availability of financial investments / supportive policy environment
- ✓ Strong local initiators and coordinators (driving demand aggregation and awareness-raising activities)
- ✓ Contribution and engagement of the local community

a) Investment: supportive policy environment & private investors

Next generation broadband connectivity needs substantial investments (see financial requirements further below). Therefore, **supportive public policies** (available public funding) are needed when commercial interests do not lead to setting up broadband infrastructure.

In the absence of public funding, securing private investments is required

Policy environment
- ✓ In Finland, the policy shift ('Broadband for Everyone') in 2008 gave the opportunity to establish an internet network cooperative in 2013 and design and build a very fast optical fibre network with Rural Development Programme (RDP) support during the 2007-13 programming period.
- ✓ In the Netherlands, no supportive public policies were identified to set up next generation broadband connectivity in rural area. In the lack of such funding, one of the main challenges remains to identify investors.

---

[1] See case study on 'Rural Digital Hubs'.

3

(e.g. by private companies settling in the area and having an interest in investing in local broadband). This remains one of the main challenges of setting up community broadband infrastructure.

However, examples show that community involvement may be needed even in cases of supportive public policy environment.

For instance, while the 'Broadband for Everyone' policy was introduced in Finland, the community approach had a strong added value in terms of identifying needs and committing members of the community (i.e. potential subscribers).

b) Initiators & coordinators

Committed local initiators always stand behind community broadband initiatives. These are most often committed local individuals who are members of the local community, and often form a non-profit organisation (or cooperative) for the organisation and coordination of the development of community broadband. Activities that are coordinated by the initiators include:

Coordinators
- ✓ In the case of the Kuhmo Network, the Cooperative of villages played a crucial role in all stages of setting up and operating the broadband infrastructure.
- ✓ In the case of Molenawaard Broadband core team (8 volunteers) was mobilised to design the process. An NGO (Molenwaard Broadband) was set up.

- planning of the broadband infrastructure;
- ensuring financial resources;
- engaging of the community (needs assessment and raising awareness about the added value of broadband connectivity);
- negotiating with local authorities and investors and telecommunication service operators;
- undertaking tasks related to the maintaining of services of the broadband infrastructure.

The ability of local initiators to identify local community needs, to engage local community members (potential subscribers) in the process and to assist local community members in how to use connectivity is in fact the main added value of community broadband initiatives compared to top-down (public and commercial) broadband investments that often do not consider the specificities of the local context, local demand and needs.

c) Community: contributors and potential subscribers

Members of the community are engaged in community broadband projects in different ways:

- Community members are involved as **initiators** and often form a legal entity (board or cooperative) for planning and running the project (see above);
- Members of the community often provide **voluntary work** (including physical work and specialist expertise) both in relation to building and managing the local broadband infrastructure. In some cases, they are requested to make their land available for the setting up of broadband infrastructure.
- Most importantly, members of the community are **potential subscribers and beneficiaries** of the services and therefore, need to understand the benefits of the opportunities offered by broadband connectivity.

Community engagement
- ✓ The Kuhmo Cooperative organised village and neighbourhood gatherings, where benefits of information society and opportunities of fast internet connections were discussed. Members of the community provided considerable contribution to constructing the fibre network through voluntary work (worth 36,000 working hours).
- ✓ The core team of Molenawaard Broadband held informal community meetings and was concerned with the engagement of community members as subscribers of the network.

5. What are the technical specificities of the broadband infrastructure?

The technical specificities of the two networks observed are very similar:

	Infrastructure	Length of network	Data speed	(Potential) subscribers
Kuhmo	Fibre optic	165 km	100 Mbps to 1 Gbps Intranet data transfer speed	200 households (74% of all households in 8 villages)
Molenwaard	Fibre optic	158 km	100 Mbps	5345 potential subscribers (67% of the population of 14 villages involved)

6. What are the financial requirements?

The financial requirements of the two networks show that **conditions for setting up fibre optic networks may vary widely** according to local conditions. In the Netherlands, the boggy soil and the system of dikes makes it much costlier to set up a broadband infrastructure. It is important to note that the costs of the Molenwaard Network are only estimates, as the works did not start yet (and funding has not been secured).

	(Estimated) costs of broadband network infrastructure	Source of funding	(Expected) revenues & return on investment
Kuhmo	**€1,884,000**	EAFRD: €627,372 National co-finance: €766,788 Private funding/ loans: €122,460 Value of villagers' voluntary work: €367,380	€28 monthly fee for internet connection 400 more subscribers/ 3-4 villages would make the network sustainable.
Molenwaard	€8,200,000* (The Network – glass fibre underground & stations) € 1,000,000* (The Hardware – Switches and optical cards & lightening equipment) **Total: €11,000,000***	20% private investment & crowdfunding; 80% loans and public funding	(estimated) €28 monthly fee Positive operational cashflow expected from Year 3. Redemption period of 30 years.

* Estimates

Specific challenges & lessons during the setting up of the broadband infrastructure

- **Securing funding:** Investments necessary for setting up community broadband networks is large with a high risk and relatively long-term (e.g. 3 years) return on investment. Supportive public policies are crucial in this regard (while the Kuhmo Network received public - EAFRD and national – funding; the Molenwaard Network is currently in the process of identifying investors - the Municipality of Molenwaard provided €30,000 for starting up the project).

- **Awareness raising** among policy-makers and potential users (especially elderly people) has been challenging. Rural areas need appropriate broadband infrastructure; and local people need to be aware of the benefits and opportunities offered by broadband connectivity.

- **Engaging the villages and the community**: The role of committed and enthusiastic local initiators ('community activists') is crucial. Voluntary work (both physical and specific expertise) has been an important success factor of both examples.

- **Overcoming market interests and profit-orientation**: Community broadband projects are initiated by local stakeholders whose primary driver is not to secure profit (although in some cases it may become a profitable business for the community in the long run), but to improve the living conditions (and the situation of local businesses, universities, individuals, etc.) in rural areas. It is often difficult to start cooperation with for-profit companies (especially telecom providers), who fear competition. This has been a challenge in the case of the Kuhmo Cooperative (where some municipal leaders and telecom service providers have been counter-productive to the process).

- **Natural conditions:** Natural conditions make the investments in glass fibre network very costly in some cases (as in the Netherlands).

- **Lack of public services:** Public services (based on new connectivity) often lag behind, i.e. do not follow the dynamics of setting up next generation broadband connectivity.

7. Main lessons and recommendations

Community broadband projects reflect real needs & opportunities and are cost-effective

Broadband infrastructure requires large investments that often only national (mainstream) programmes can secure. However, community involvement in the process has considerable advantages (as presented above) as far assessment of demand, cost-efficiency on infrastructure, and increasing the number of subscribers is concerned and awareness about the potential benefits of broadband are concerned.

,,Modern societies are too much profit-oriented. With community broadband, we don't want to produce profit. We only want a better quality of life in rural areas.''

Philip Donner, Kuhmo Cooperative

Pilot initiatives are crucial to test the ground

Bottom-up approach is needed to go through the learning process. In the case of broadband infrastructure this means understanding and testing where and how investments can be best made, how potential villages and subscribers can be engaged, and how the new connectivity will best support the local community.

Committed leaders and community engagement from the start

A strong leadership and commitment from local leaders and organisations are crucial for the success of community broadband, as this requires extensive coordination efforts for engaging sufficient number of villages and inhabitants / subscribers, create economies of scale, represent the interest in the negotiations with local municipalities and telecommunication companies, secure voluntary work (both physical and specialist expertise).

,,We have a lot of advantages compared to top-down broadband investments: We build much cheaper, we produce high level of penetration which national companies can't even dream of. Since we are locally rooted it's much easier for us to approach land owners and households with specific requests. ''

Philip Donner

Community broadband opens new opportunities

The main added value of community broadband is not the infrastructural investment itself, but the new opportunities that it brings to rural areas. Beneficiaries of next generation broadband are not only businesses, but the wider rural community, especially in highly remote areas: broadband attracts or keeps young people in rural areas, and it improves basic services (including for the older generations).