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# **Rural broadband initiatives in the Netherlands as a training ground for neo-endogenous development**

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## **Abstract**

Rural broadband is assumed to be a solution to a variety of rural issues, yet the delivery of broadband to rural areas remains problematic. On the basis of a database of 75 rural broadband initiatives in the Netherlands and the information gathered by studying two initiatives in-depth for a number of years, the authors discuss how citizens instigate and run initiatives to improve internet connectivity. The authors present an 8-stage model that demonstrates that citizens, governments and market players have impact on the completion of each of these stages, highlighting the neo-endogenous character of rural broadband. In this neo-endogenous context both established market players and governments find it difficult to relinquish their usual approaches. Market players attempt to frustrate initiatives with rigid policies in order to prevent their share of the market being threatened. On paper governments stress the importance of local action, but in practice they come up with wavering or generic policies, neglecting local organizational differences and frustrating the progress. The broadband initiatives are in a constant learning curve and require perseverance as well as social, intellectual and financial capital. The current conditions under which the local initiatives operate endanger the realization of broadband in rural areas in the Netherlands.

## **Keywords**

Rural broadband, Next Generation Access, Rural penalty, Local initiatives, Neo-endogenous development

## **Introduction**

Since the emergence of the internet in the 1990s, rural areas in advanced economies have been disadvantaged with respect to the development of their digital connections. The telecom market does not consider these areas to be sufficiently lucrative, as the number of potential users is low and the costs are high (Cambini & Jiang, 2009; Townsend et al., 2013). In most Western countries, national and regional governments are unable – due to for example (EU) regulation – or unwilling – because of political and thus financial priorities – to provide rural citizens with

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high-speed internet. This is also the case in the Netherlands and has impacted a number of rural sectors and stakeholders (Salemink & Strijker, 2015).

Recently, many local initiative groups came into being to create local solutions for this disadvantageous situation; in our case in the Netherlands, but for example the UK also has seen a rise in the number of initiatives (Ashmore et al., 2015). In these initiatives citizens, farmers, entrepreneurs, in collaboration with other local stakeholders, try to install fixed broadband networks or wireless solutions. Against the laws of the market, these initiatives try to realize a fast and reliable broadband connection – or Next Generation Access – for their community. There is some variation when it comes to speed and capacity, but a previous study has shown that most of them aim for an easily upscalable network – regarding both speed and number of users – of at least 30 Mbps and up to 100 Mbps (Salemink & Strijker, 2015).

The emergence of these broadband initiatives has resulted in a complex interplay between market players, governments on various levels, and local communities. This article discusses the emergence of these initiatives and their importance for the Dutch countryside and rural development. It consists of an analysis of 75 initiatives<sup>2</sup> spread across the Netherlands and a detailed multiannual analysis of two specific cases in the East Groningen region and the Northeast Drenthe region. On the basis of these data, the article shows which factors play a role in the success or failure of this type of initiative. Describing eight stages of rural broadband initiatives (see also Salemink et al., 2015a; Salemink & Strijker, 2015) allows us to clearly demonstrate that established market players and governments find it difficult to respond appropriately to this new approach to realizing broadband connections. The article concludes with a reflection on the role of the market and the various governments. These kinds of citizen initiatives are not exclusive to the issue of broadband. Other examples include initiatives for community care (Bokhorst, 2015), community transport (Ward et al., 2013), community shops (Calderwood & Davies, 2013), renewable energy (Callaghan & Williams, 2014). This paper shows, however, that broadband turns out to be a striking example of community action for rural development, and the community learning that comes with it.

### **From digital divide to rural penalty**

Rural communities have experienced great difficulties in keeping up with digital developments (Malecki, 2003). To this day they find themselves on the wrong side of what is known as the ‘digital divide’ (Townsend et al., 2015). These difficulties are comparable to earlier developments in the twentieth century, when it proved to be difficult to equip the most isolated households with utilities such as water, electricity and telephone (Salemink et al., 2015b). The upgrading – or substitution – of the telephone network to internet technology has remained costly, if not altogether unprofitable, in rural areas (Cambini & Jiang, 2009). The

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<sup>2</sup> At the start of the analysis in April 2015, the database consisted of 75 initiatives. In September 2015 the database consisted of 86 initiatives, covering 133 municipalities in all 12 provinces

telecommunication market was liberalized in the 1990s, at which time the market players (privatized state or municipal companies such as KPN and Ziggo in the Netherlands) became responsible for ensuring a suitable connection.

There are a number of technologies on the market for providing internet connections, such as the telephone (ADSL or VDSL), but also ‘Next Generation Access’ (NGA) using coaxial cable, fibre-optic or mobile internet. The Dutch countryside generally does not have access to these NGA networks. Most rural addresses do have access to a basic form of internet through a telephone line, even in the most remote places, but the available minimum speed then is approximately 2Mb/Sec (Stratix, 2015; [www.breedbandatlas.nl](http://www.breedbandatlas.nl)). This means that many digital services cannot be used, such as cloud services, videoconferencing, distant learning applications, and eGovernment services (Townsend et al., 2015). Due to low address density – and thus insufficient numbers of customers – and long digging distances, rural areas are not an attractive area of investment for telecommunications companies. They prefer to invest in urban areas with a high address density and a high market potential (Townsend et al., 2013). As many other governments in Europe, the Dutch government does not regard high-speed internet access as a utility. However, it is convinced of the necessity of proper internet access in rural areas (Letter to the Dutch Parliament DGETM-TM/15027850, 2015) .

The Dutch government has not yet found an instrument to resolve the market deficit. Furthermore, European regulations on the distribution of state funds have in the past prevented financial support from being directed towards establishing new networks (Cambini & Jiang, 2009). The European Commission recently adjusted its regulations in this respect. In the ‘white areas’ – areas with no more than one provider of basic broadband and no providers of Next Generation Access – authorities are allowed to offer financial support to improve internet connections (European Commission, 2013).

In the Netherlands these ‘white areas’ mainly comprise rural areas, i.e. countryside areas outside the curtilage of villages, and business parks on the edge of towns (Stratix, 2015). The exact number of affected addresses is unknown, but two recent estimations indicate that between 200,000 and 220,000 addresses, that is to say half a million inhabitants, and 60,000 companies have no access to future-proof internet – i.e. easily upscalable high-speed networks – all of which are located in rural areas (Salemink, 2014; Stratix 2015). Malecki (2003, p. 201) places this lacuna in the broader context of poor access to key services in rural areas as compared to urban areas – both online and offline (healthcare, education, public transport) – also known as the ‘rural penalty’.

### **Market failure as a driver for local initiatives**

Various actors in rural areas suffer daily from limitations on their internet capacity. Companies have trouble conducting their business, farmers are unable to operate their digitally controlled machines, those in need are unable to receive the newest digital forms of care, and young family

members experience problems in digital learning environments (Farrington et al., 2015; Townsend et al., 2015). As a result, the quality of internet connections is increasingly becoming a decisive location factor, particularly in those rural areas that are under pressure from ageing and a shrinking population (PBL Netherlands Environmental Assessment Agency, 2013). LaRose et al. (2011) state that, in fact, the problem of service decline and remoteness in general could for a large part be solved by improved digital connectivity, yet so far the quality of digital connectivity only highlights the remoteness of rural areas.

Irritation, but also hope for a better future with a quick and reliable internet connection, has driven active citizens and entrepreneurs to create their own initiatives and establish a Next Generation Access network. They no longer trust that the market will provide an affordable solution in due course. Often their ideal is a fully open network accessible to all service providers and owned by a local cooperative (Salemink & Bosworth, 2014). They wish to manage the network themselves and no longer be dependent on external telecom companies for potential solutions, ensuring a future-proof network which can promote community resilience (Ashmore et al., 2015).

Such local actions in response to the market deficit are reshaping the relationship between external and local stakeholders in rural areas. This is also known as neo-endogenous rural development (Shucksmith, 2010; Bosworth et al., 2015). For decades regional and rural development was primarily driven by external parties, such as national governments that decentralized national services to peripheral areas. Since the emergence of more neoliberal policy agendas in the 1990s, exogenous actors have been less active in stimulating this process. As a result, rural areas and communities have had to increasingly rely on their 'endogenous resources' (Terluin, 2003; Dargan & Shucksmith, 2008). However, in the case of broadband, rural communities cannot manage with endogenous resources alone. Social, intellectual and financial capital are required (Bourdieu, 1986) to create a broadband network, for instance to establish and maintain contacts with external parties such as governments, market parties, IT consultants, financial institutions, property owners. Furthermore, every separate negotiation with one of these contacts requires sector-specific knowledge and competencies, highlighting the multifaceted and complex nature of rural broadband. Crucial in this is that these forms of capital are not available in equal measure in all rural areas (see also The Netherlands Institute for Social Research, 2015). Other essential factors for starting and running initiatives, such as social entrepreneurship (Wallace et al., 2016) and, most importantly, perseverance (Salemink and Strijker, 2015), are also unequally divided over space. This begs the question as to what will be the spatial impact of the current approach of the Dutch government.

## **Methodology**

As from 2011 the authors have engaged in two projects regarding rural broadband provision. Both projects have been carried out for the Province of Groningen in the Northern Netherlands. The first project '*Breedband op het platteland*' [Broadband in rural areas] (2011-2013) involved

an explorative study of the institutional and technological landscape of rural broadband. The second project ‘*Next Generation Access voor heel Groningen*’ [Next Generation Access for the entire province of Groningen] (2014-2015) was a study of the progress of rural broadband initiatives. Both studies included international and national examples, but the implications of the findings were focused on the Province of Groningen. During these research projects the authors got in contact with many rural broadband stakeholders, such as policy makers and rural broadband initiatives. These contacts resulted in a first version of our database of initiatives and gave a first impression that rural broadband initiatives were a phenomenon of growing importance (Salemink & Strijker, 2015).

Building on these first results and using an online inventory and online call<sup>3</sup> we provisionally traced 75 broadband initiatives that were active in Dutch rural areas (as per April 2015). These 75 initiatives are spread across all 12 provinces and cover 116 municipalities, primarily outside the Randstad area. The amount of information varies per initiative, but because we gathered information on every characteristic in Table 1 for all 75 initiatives, it is sufficient to provide a general picture of the Dutch broadband landscape. We documented and described broadband initiative groups on the basis of the following points:

[INSERT TABLE 1 HERE]

In addition to the above-mentioned database, we also followed the development of the Stichting Oldambt Verbindt (Oldambt Connects Foundation) in the province of Groningen in the period from January 2012 until April 2015<sup>4</sup> and ECO Oostermoer (Oostermoer refers to the historical region) in the province of Drenthe from February 2013 until April 2015. During this period we interviewed the people involved and observed during meetings. On the basis of these interviews and observations we were able to describe in more detail the stages a broadband initiative follows and what exogenous and endogenous powers play a role in this context.

### **Rural broadband initiatives in the Netherlands: A diverse landscape**

We were able to extract a general process for rural broadband. This process is discussed in the next section, but first we discuss the elements of variety we found in the database. The first important point of variation between the initiatives is the scope of their area of operation. Some initiatives encompass a number of municipalities, while others only cover a few dozen addresses. The origin of the initiatives and the key persons involved also vary greatly, from rural entrepreneurs to active highly educated ‘newcomers’. The key persons form the basis of the further network created by a given group. The group often seeks support from local governments, but also from major market players, or farmers’ organisations.

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<sup>3</sup> <http://www.rug.nl/news/2014/12/initiatieven-breedband-op-het-platteland-in-kaart>

<sup>4</sup> See also: [www.oldambtverbindt.nl](http://www.oldambtverbindt.nl)

An important difference we found in our database is the blend of bottom-up and top-down initiatives. Some cases clearly have come from a bottom-up or a grass-root movement, whereas other cases are initiated by top-down forces such as local governments or regional cable companies. The two in-depth cases in this paper are exemplary. ECO Oostermoer is a local action group, run by citizens, aiming for locally sourced renewable energy and fibre-optic broadband. Stichting Oldambt Verbindt, on the other hand, originates from top-down forces such as municipally-initiated meetings, and their board consists of mainly representatives of local and regional institutions.

Key persons generally determine the flavour of the initiative. The broader the representation of various stakeholders in the group, the broader the campaign's argument that broadband will benefit the social and economic development of the entire area. Initiative groups that are led by farmers and other entrepreneurs focus primarily on economic arguments. There are also differences in the choice of technology and the nature of the network. Technically speaking, fibre-optic connections are superior to other technologies such as cable or 4G connections (Stratix, 2015). However, some initiatives seem to be satisfied with any level of improvement, even if it does not involve optical fibres. This results in a patchwork of different approaches. Furthermore, even when initiatives chose the same technology, network designs can vary considerably. This could prevent network integration in the future.

At the regional level some provinces try to structure this patchwork, but in doing that they run the risk of disregarding local differences. The provinces of Friesland, Drenthe, Overijssel and North Brabant currently have policies to support the initiatives. In order to structure and make the developments of the initiatives manageable, provinces come up with standardized or generic policies (see for example Province of Drenthe, 2015; Province of Overijssel, 2015). The fear of local initiatives, in particular those in an advanced stage, is that the generic character of the policies and centralized management will slow down the process, forcing the more advanced initiatives to adapt to these new policy conditions (observations at ECO Oostermoer). The initiative groups are also afraid of losing their 'self-determination' and becoming an instrument of government policy (observations at Stichting Oldambt Verbindt). Furthermore, political parties can integrate broadband in rural areas into political campaigns, which the major market players can use to their own advantage.

The market and policy context vary greatly per initiative; any similarities are primarily to be found in the impact of nationwide market players or province-wide policy. The complex and reciprocal relation between government, market and citizen is specific to each area. External parties such as established market players – in the case of the coaxial provider with global shareholders – try to protect their financial interests by preventing citizens' initiatives from extending to their own area of operation. The Liberty Global owned coaxial provider Ziggo, for example, uses media campaigns to stress the quality of their network in a certain municipality. In

these media campaigns, however, they are not clear about the fact that they do not serve all households and business in that municipality (see for example *De Gelderlander*, 9 January 2015). The absence or lack of clarity regarding government policy and regulation on the national, regional and local level leads to great uncertainties for the initiative groups (Saleminck & Strijker, 2015). This fact notwithstanding, the Minister of Economic Affairs recently indicated in a letter to the Dutch Parliament that the local initiatives are essential in realizing a broadband network in remote areas (Letter to the Dutch Parliament DGETM-TM/15027850, 2015).

### **Cooperative process for broadband in rural areas**

On the basis of the database and detailed insights from Stichting Oldambt Verbindt and ECO Oostermoer we distinguish eight stages in the process of establishing a cooperative broadband network in rural areas. This is not a blueprint; it may be that initiatives combine a number of stages, or that they have to take some stages more than once if complications arise in a subsequent stage<sup>5</sup>. For each stage we describe the role of the established nationally operating market players and the various levels of government. We also describe the implications these roles have. This shows clearly how innovative interplay comes about, but also how innovative (and in some cases traditional) opposition arises. For each stage we indicate how many initiatives have completed it; the other initiatives have not yet completed this specific stage or a previous one. This makes it clear which stages we can consider to be decisive in the overall process.

#### *Stage 1: Incentive (73)*

Initiatives usually start with the observation that the market for Next Generation Access does not serve their area. In response, initiative will try to provide the under-served area with future-proof broadband access, because “all kinds of stakeholders in the area need a fast and reliable internet connection” (Board member during a meeting of Stichting Oldambt Verbindt).

If the initiative originates from bottom-up forces, it usually involves a small number of key persons (see also Ashmore et al., 2015; Wallace et al., 2016). In areas with existing networks or action groups, for example LEADER areas, initiative groups often either originate in or join these existing networks. In order for an initiative to materialize, social capital and organizational skills must be available in the area. In addition, we noticed that many pioneers in this field can be found in the vicinity of Eindhoven and Enschede, two cities with technical universities whose staff possess the relevant intellectual capital and live, at least in some cases, in the surrounding accessible rural municipalities.

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<sup>5</sup> Stratix consultancy has published a report together with Rabobank, commissioned by the Ministry of Economic Affairs, which also describes the process of broadband initiatives. However, Stratix Consultancy describes the process and accompanying steps as a model that prescribes steps that should be followed in order to be successful. Our 8-stage model, on the other hand, is based on an analysis of empirical findings and is composed through induction.

In the case of top-down initiatives, the process is at first facilitated by the local or regional government or a local or regional cable company. In sparsely populated areas with little social, intellectual or financial capital, these governments are more likely to act as the driving force because it is less likely that citizens' initiatives will originate in these areas.

### *Stage 2: Familiarization (52)*

Rural broadband is technically and financially complex and this can be discouraging to some initiatives. Familiarization is the first clear distinguishing step between the potentially successful groups and those that are less likely to succeed. It is also at this stage that the decision is usually made to aim for an open network owned by the community. Bottom-up initiatives tend to prefer an open network managed by the community, as a reaction to the deficit created by the market.

At first some groups turn to established market players, who as a rule 'reassure' the key persons and tell them that everything will turn out all right in the long term, without presenting them with concrete alternatives (observations at Stichting Oldambt Verbindt and ECO Oostermoer). This tactic may have the effect of 'curbing' the initiative. Some initiatives choose to rely on – or collaborate with – the market player in question. This leads to the original ideal of an open network being abandoned and the initiative relinquishing its self-determination, as established market players will not accommodate community-managed networks (Salemink et al., 2015a).

Knowledge of the telecom sector can help accelerate this phase, but our observations at Stichting Oldambt Verbindt and ECO Oostermoer show that the progress of an initiative group is as fast as that of its slowest key persons. Quicker members run the risk of running ahead, which undermines the cooperative spirit of the initiative. Such internal frictions can even lead to the formation of new competing initiatives within the same area. Initiatives that are led by small regional cable companies, for example in the Province of Friesland, Twente region, and the municipalities of Veendam and Harderwijk, are at an advantage in this step. They have the required technical expertise and they know how the broadband market works.

### *Stage 3: Inventory of demand (35)*

In many cases this stage marks the official establishment of a cooperative or association. The previous stages are mostly characterized by informal self-organization. An inventory of demand requires an indicative business case for a preliminary area of operation, with estimated total costs and recommended prices. This requires intellectual capital – a thorough understanding of the matter – and financial capital, which are decisive factors that determine the likelihood of success at this stage.

If there is enough demand, the groups usually decide to proceed. If demand is limited, some groups decide to stop, while others start campaigning (Stage 4). Optimaas in Aalburg and LanderdNet in Landerd, both located in the Province of North Brabant, are examples of initiatives that were discontinued as a result of lack of demand. The subsequent decision of the

respective municipalities to no longer support the initiative – since there was no demand to justify this support – led to a definitive end in both cases.

#### *Stage 4: Campaigning (31)*

Campaigns are usually launched to convince inhabitants and businesses located within the area of operation to sign up for broadband. The more participants, the greater the chances of success. Bottom-up initiatives make use of their local knowledge and network, but they need financial support in order to professionalize their approach. This is the point at which many bottom-up initiatives ask for support from the government (usually the municipality, in some cases the province). Endogenous resources are often not enough to run a campaign. The initiatives can be delayed by a failure or contretemps in securing funding, but also by a lack of concrete policy. Initiatives in the Province of Drenthe – such as ECO Oostermoer – and in the Province of Gelderland, where policy has by now been formulated, indicate that their projects were delayed as a result of the slow progress of the provincial government.

Top-down initiatives, on the other hand, can launch professional campaigns because they have the required resources and expertise. However, they run the risk of applying a ‘one size fits all strategy’ which does not do justice to the local situation. Top-down initiatives more frequently experience problems in organizing a network for accessing local expertise and conducting the campaign. This is where external parties really need local stakeholders. Local social capital is essential at this stage, especially for building trust (observations at ECO Oostermoer).

In the campaigning stage the established market players sometimes launch counter-campaigns of their own. Competition from the initiatives, in some cases with competing technologies, reflects on their product, even if they do not serve the initiative’s area of operation. In order to protect their market position and shareholder value, they slash prices in surrounding areas of operation, such as the larger villages, to create the impression that they are solving the problem and ultimately hinder the bundling of demand (observations at ECO Oostermoer).

#### *Stage 5: Bundling demand (15)*

Once the campaign has been conducted, the demand in the area should be bundled. The objective of this step is to have as many inhabitants as possible commit to subscribe to and pay for services, subject to sufficient demand. The analyses of the database shows that this requires a commitment from over 50% of the addresses. Areas with long digging distances, and therefore higher costs per user, often require a higher percentage in order to create a profitable business case.

The bundling of demand may also reveal how much money the initiative still needs in order to create a feasible business case. Some provinces, such as Friesland, Overijssel, Drenthe, and Gelderland, are prepared to make the initiative’s business case profitable by granting a soft loan, but only once the maximum amount of money has been obtained from the market (as many participants as possible, and maximum feasible contribution per user). Due to European

legislation on state funding, only activities in the ‘white areas’ can be granted financial support (European Commission, 2013). The initiatives that have reached this stage are not always successful in bundling demand. Bergen Breedband, Breedband Alkmaar-Buiten, and SallandGlas for example, have had to prolong their deadline for subscription. The initiatives that experience this state in the media that this is a delay and it does not mean the initiative will be cancelled. The 75 cases in the database show that substantial social capital is required at this stage to start bundling demand. Trust proves to be very important at this stage of rural broadband initiatives. Observations at Stichting Oldambt Verbindt and ECO Oostermoer also show that intellectual capital – understanding why broadband is important – and financial capital – being able to afford the high fees – are important in the decision making.

#### *Stage 6: Tender and Contracting (12)*

We have less information on this stage and stage 7 and 8, because only 15 of the 75 initiatives have completed the bundling of demand step, while 16 others are still trying to complete stage 5. Furthermore, information on this stage is often confidential, since contractors and providers do not want to reveal their competitive edge. During the tender and contracting it is important that the initiative is able to impose requirements on the network, for example an open network – if that is still an aim – and full coverage of the area of operation. A full coverage network does require solidarity from the households and companies that are less remote. Potentially, they would be able to gain access to broadband for a lower price if the more remote addresses did not take part. Most broadband initiatives want to connect all addresses, which requires them to appeal to community solidarity.

The contracting process can also be time-consuming, and therefore initiatives do not advance to stage 7 quickly and without problems. Legal and financial issues are usually the cause of the struggles at this stage. Often these issues prove to be too complex for the initiatives, showing the need for professional support.

#### *Stage 7: Construction and commissioning (4)*

Local involvement, knowledge and support are important in the construction stage. Some groups of inhabitants or companies opt to do some of the digging work themselves in order to keep the costs down (for UK examples of this see Ashmore et al., 2015). In addition, it may be necessary for these routes to be dug through privately-owned plots. In this phase, the role of being a commissioning party and managing the everyday issues of construction require the initiative to possess another set of relevant skills, knowledge, and experience. Stage 7 therefore shows that with the development of the initiative, the capacities of the key persons also have to develop. In the case of ECO Oostermoer the key persons try to anticipate this by recruiting volunteers that have these capacities.

#### *Stage 8: Management and maintenance (4 networks currently operational)*

At this stage, the initiatives require technical support to manage the network. Outsourcing of the management and maintenance is usually considered at this stage. In their role as commissioning party, the initiatives set requirements on network management. Once this stage is reached the process is completed. There are examples of initiatives that decide after all to turn to established market players. The Province of Drenthe even states in its funding and implementation policy that initiatives should at the start determine an ‘exit strategy’ to sell the network to market players (Province of Drenthe, 2015). This once again requires technical expertise in the negotiations regarding outsourcing.

Two of the four operational networks that are included in our database are fibre-optic networks, while the other two are wireless. BoekelNet was the first bottom-up operational fibre-optic network of the Netherlands to be owned by a cooperative. The municipality’s role as facilitator and source of financial support played a key role in the realization of this project.

The diverse landscape of rural broadband in the Netherlands is presented in Map 1. This map shows the 75 initiatives that were analysed and the stage they were in at the moment of analysis. The initiatives are predominantly based in areas outside the *Randstad area* (metropolitan region in the West) in the North, East, and Southeast of the country.

[INSERT MAP 1 HERE]

## **Discussion and Conclusion**

### *Opportunities and challenges for cooperative interplay*

The emergence of a large number of initiatives shows the necessity of broadband connections in rural areas, but it does not in any way guarantee that these areas will eventually be successfully connected to a future-proof network. The outcomes of the process for rural broadband seem uncertain. We discovered that the inventory and bundling of demand in particular are decisive stages in which many initiatives struggle to move forward. During these stages the bottom-up initiatives especially are dependent on the support – or non-opposition at the least – of governments and market players. The case of ECO Oostermoer, for example, shows that negotiations with the province about the terms and conditions for funding require a lot of time and effort of the initiative. The market players, on the other hand, are usually only willing to cooperate on the condition that they will later own the network (observations at Stichting Oldambt Verbindt and ECO Oostermoer), while many initiatives are committed to creating an open network that they own and manage themselves. These opposing interests of the initiative and the telco often results in an internal conflict within the initiative about what should be prioritized: self-determination and following the original plan, or settling for an altered plan with the telco in which self-determination is lost but the network will be realized? Managing the expectations of potential users proves to be both crucial and difficult at this stage. As long as there is conflict within the initiative and there is no prospect of a cooperating market player, the initiative will not succeed.

In addition, wavering policy on the part of local and regional governments, uncertainty about EU requirements related to state-support, as well as an absence of national policy, results in insecurity and requires much time and energy – an investment that not every initiative or group is able to sustain. Although this is not a unique finding for rural broadband – Bosworth et al. (2015) made similar observations regarding LEADER programs in the UK – the struggle to keep up with policy changes resonated throughout the Dutch rural broadband landscape. Insights from Stichting Oldambt Verbindt and ECO Oostermoer show that the capacity of an initiative can come under pressure and the key persons can get ‘tired of policy’ (*beleidsmoe*). The overall picture of rural broadband initiatives in the Netherlands begs a question about the degree of skills, capabilities, and perseverance that is required. Not every rural area in the Netherlands possesses that degree, hence the absence of rural broadband initiatives in some of the Dutch ‘white areas’. Furthermore, and more critically, our analysis indicates that the key persons in rural broadband initiatives run the risk of ‘volunteer burnout’. Once that occurs, initiatives are at a considerable risk of failing.

In both bottom-up and in top-down initiatives, governments and citizens need each other in order to bring the initiative to completion. An initiative typically begins on a small scale, with a small group of key persons, but often it soon becomes apparent that cooperation is required with various stakeholders, both exogenous and endogenous, in order to actually realize the broadband network. Local political conflicts and large-scale market interests can hinder progress. In some more advanced initiatives, a cooperative as an organizational form – and thus the formalization of collaboration between citizens, government, and institutions – has ensured that the cooperative activities were in line with political decision-making, thus greatly accelerating the overall process, in any case up to the stage of bundling demand.

This paper also shows that efforts to create a broadband network represent a modern form of rural development. A single player is no longer sufficient; rather, the process requires a cooperative interplay between highly educated and highly skilled citizens, governments and market players, confirming the theory of neo-endogenous rural development. This interplay requires various forms of capital and, above all, sector-specific skills which do not come natural to every citizen. Endogenous and exogenous actors and capital have to contribute in order to create a rural broadband network. This interplay is not unique to rural areas as a location or broadband connections as a theme, but the example does show to what extent actors are able and willing to cooperate. Furthermore, local and regional governments are forced by market players and initiatives to reconsider the current situation in which the free market acts as an instrument for providing every Dutch citizen with telecom services.

*Rural broadband as a vehicle for neo-endogenous development: the reclaiming of rural futures*  
Many initiatives arise in response to a failing market or a reticent government. Once the first steps in the process have been completed, it often appears that initiatives actually need the

cooperation – or non-opposition – of market players and governments in order to achieve their objective. In the case of rural broadband initiatives, it is important for the local actors – citizens and entrepreneurs in particular – to be able to take part on their own terms and, ultimately, to be able to achieve their own objectives. The analysis in this paper shows that power inequalities and a dependence on external parties – or exogenous forces – may hinder and delay this process. In addition, reclaiming and maintaining self-determination appears to be important to local stakeholders. Many campaigns for broadband in rural areas emphasize this reclaiming of self-determination as a triumph that citizens can jointly achieve themselves, a triumph that proves that the ‘rural penalty’ can be overcome. Behind this pursuit of broadband lies a deeper desire for a liveable countryside, in which the citizen takes on an increasingly active role. In this light, the initiatives for rural broadband can be seen as a vehicle for rural emancipation and neo-endogenous development. Nevertheless, citizens organizing everything themselves seems to be a utopia as far as broadband networks in rural areas are concerned.

The free market rationale forces one to do things well, but it does not necessarily force one to do the right thing. Local groups increasingly define what is right for them, and work towards making it happen. In order to do that, they have to be able to organize themselves and bundle demand. They then have to be able to safeguard their own objectives and interests. It is up to the government to support – or at least not hinder – this self-organization and to initiate it where it does not come about naturally. In doing that, governments should not hinder the objectives of an initiative; doing so would alienate the local citizens and entrepreneurs. This could prove to be fatal, since under the current conditions broadband in remote rural areas does not seem to be feasible without the commitment of local citizens and entrepreneurs.

The journey towards Next Generation Access is accompanied by ‘Next Generation Rural development’ with a neo-endogenous character. The broadband initiatives act as a suitable training ground and learning experience for broader rural issues. From an endogenous perspective, delivering rural broadband requires a great variety of knowledge, skills, and capacities throughout the process. Every stage has its specific requirements and as the initiative develops, the key persons have to deal with this variety of changing requirements. The question remains, however, if every rural area and community holds these key persons and the much needed social, intellectual, and financial capital.

From an exogenous perspective, a similar learning experience applies to governments and market players. Some of them are able to respond effectively to the local initiatives, by facilitating and enabling the local action. Others, however, find it difficult to relinquish their usual approaches, resulting in more conservative responses. The current policy conditions endanger the universal realization of broadband in rural areas in the Netherlands by local initiatives. The key to successful rural broadband initiatives lies in the cooperative interplay between the various stakeholders. To contribute to the knowledge about this interplay, we therefore suggest that

research on rural broadband – and rural development more generally – focuses on the mutual learning between endogenous and exogenous actors.

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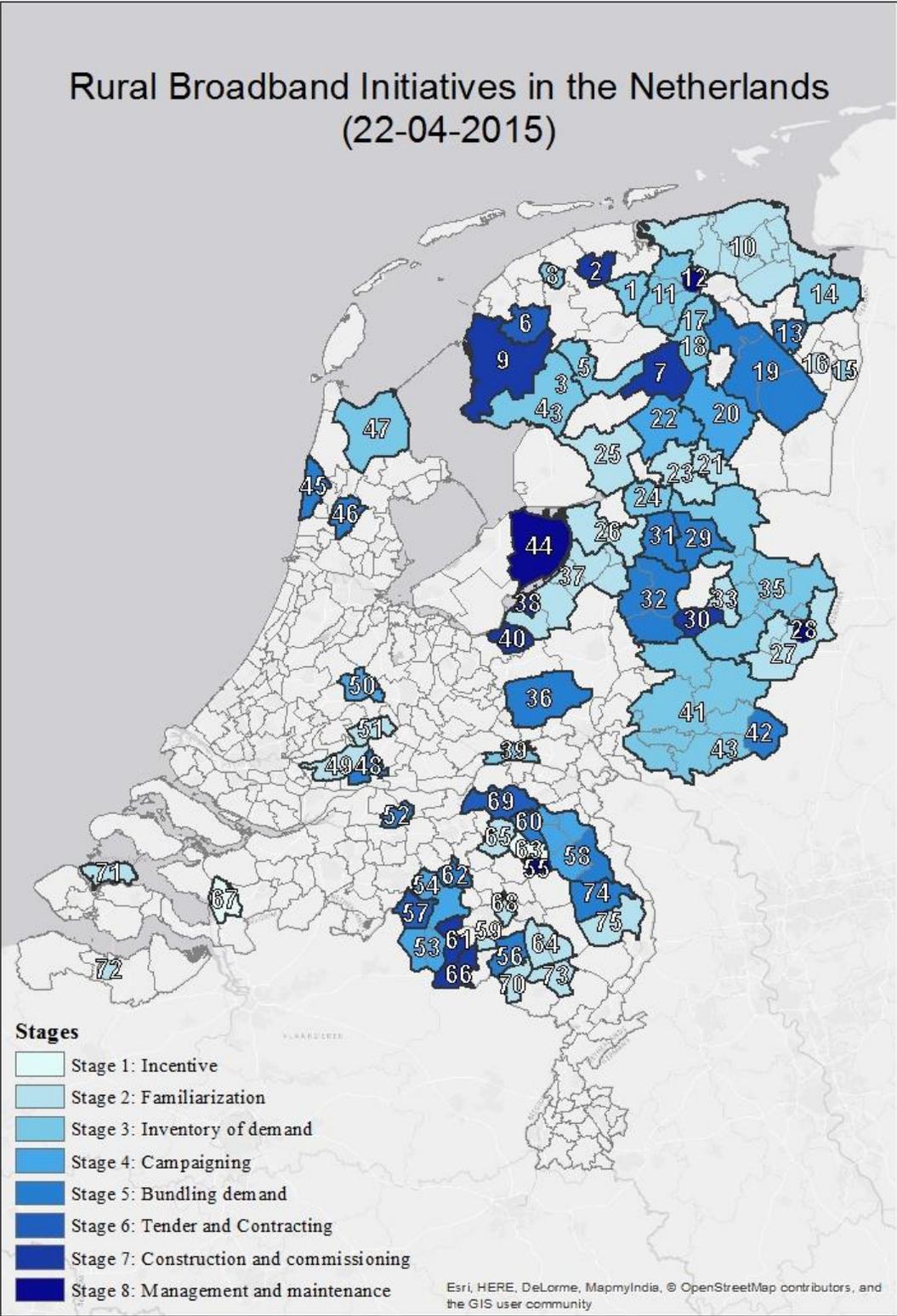
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**Table 1. Descriptive characteristics of rural broadband initiatives**

<b>Characteristic</b>	<b>Information on initiative</b>
<b>Area of operation</b>	Target area, ambitions for scaling, the governments and telecommunications companies (telco's) involved in that area
<b>Key persons or organizations</b>	Background of key persons and/or organizations on the board
<b>Network relations of the key persons</b>	Relations of key persons to governments, embeddedness in specific economic sectors, experience in local government or volunteering and community action
<b>Arguments in the campaign</b>	Style of campaign (targeted vs. generic), focus on specific economic sectors (agriculture, 'cottage industries'), statements from various media sources
<b>Status of the initiative</b>	Stage of the 8-stage model the initiative is at as per April 2015 and the development towards that stage
<b>Character of the network</b>	'Open network' managed by the community or a closed turn-key network managed by a telco, technology used for the network (fibre-optics, coaxial cable, wireless)

Map 1



Number	Initiative	Province	Stage (1-8)
1	Stichting Glasvezel Achtkarspelen (bedrijventerrein)	Friesland	3
2	Kabel Noord in Sybrandahûs	Friesland	7
3	Follega-Eesterga	Friesland	3
4	Brekkenpolder-Tacoziyl	Friesland	3
5	Glasvezel Hoornsterzwaag	Friesland	3
6	De Fjouwer Doarpen en Hidaard	Friesland	6
7	Stichting Glasvezelnetwerk Langedijke	Friesland	7
8	Stichting Glasvezelnetwerk Middelsee (bedrijventerrein)	Friesland	3
9	Stichting Glasvezelnetwerk Snitserdyk	Friesland	7
10	Project Breedband Noord-Groningen	Groningen	2
11	Stichting Breedband Westerkwartier	Groningen	3
12	Den Horn Online	Groningen	8
13	Kabelnet Veendam	Groningen	5
14	<b>Oldambt Verbindt</b>	Groningen	3
15	Harpel	Groningen	3
16	Plaatselijk Belang Vledderveen	Groningen	2
17	De Kop Breed	Drenthe	3
18	Noordenveld Zuid	Drenthe	3
19	<b>Eco Oostermoer</b>	Drenthe	5
20	Sterk Midden-Drenthe	Drenthe	4
21	Werkgroep ZaandDörpen op Glas	Drenthe	2
22	Westerveld op Glas	Drenthe	4
23	Breedband de Wolden	Drenthe	2
24	Staphorst	Overijssel	3
25	Steenwijkerland	Overijssel	2
26	Stichting IJsseldelta Glas Buitengebied (IJDGB)	Overijssel	2
27	Initiatief Enschede-Haaksbergen-Losser-Hengelo	Overijssel	2
28	Lonneker	Overijssel	8
29	Vechtdal Breed	Overijssel	5
30	Glasvezel in het buitengebied Rijssen-Holten	Overijssel	7
31	Breedband buitengebied Dalfsen	Overijssel	5
32	SallandGlas	Overijssel	5
33	Initiatiefgroep Glasvezel SPOW	Overijssel	2
34	Notter-Zuna	Overijssel	3
35	Cogas	Overijssel	3
36	Lunteren.net (coöperatie)	Gelderland	5
37	Breedband Noord-Veluwe	Gelderland	2
38	CAI Harderwijk/Stichting Breedband voor het Buitengebied	Gelderland	7
39	Buren op Glas	Gelderland	3

40	Initiatiefgroep Glasvezel Buitengebied Putten	Gelderland	7
41	Breedbandbedrijf Gelderland	Gelderland	3
42	Coöperatie Breedband Buitengebied Winterswijk	Gelderland	5
43	Breedband Buitengebied Aalten	Gelderland	3
44	Greenet	Flevoland	8
45	Coöperatie Bergen Breedband	Noord-Holland	5
46	Breedband Alkmaar-Buiten	Noord-Holland	5
47	Coöperatie Hollands Kroon	Noord-Holland	3
48	Stichting GiessenlandenNet	Zuid-Holland	5
49	Breedband Molenwaard	Zuid-Holland	2
50	Projectgroep Glasvezel (Zegveld en de Meije)	Utrecht	4
51	Werkgroep Polsbroek	Utrecht	2
52	Optimaas Aalburg (gestopt)	Noord-Brabant	5
53	KempenGlas	Noord-Brabant	4
54	OisterwijkGlas	Noord-Brabant	2
55	Stichting Boekelnet	Noord-Brabant	8
56	HSLnet	Noord-Brabant	5
57	Coöperatie Hilverglas	Noord-Brabant	6
58	LVCNET (Land van Cuijk)	Noord-Brabant	5
59	Kabeltelevisie Waalre	Noord-Brabant	2
60	LanderdNet (gestopt)	Noord-Brabant	5
61	Eersel Verbonden	Noord-Brabant	7
62	Glasvezel Boxtel	Noord-Brabant	5
63	Uden	Noord-Brabant	1
64	Initiatiefgroep Glasvezel Buitengebied Asten-Someren	Noord-Brabant	2
65	Bernheze	Noord-Brabant	2
66	Bergeijk	Noord-Brabant	7
67	Bergen op Zoom	Noord-Brabant	1
68	OnsNet Nuenen	Noord-Brabant	2
69	Stichting Maaskantnet	Noord-Brabant	6
70	Cranendonck	Noord-Brabant	2
71	Energiek Noord-Beveland	Zeeland	2
72	Delta	Zeeland	2
73	Glasvezel Buitengebied Nederweert	Limburg	2
74	GlaswebVenray	Limburg	5
75	Glasvezel voor iedereen	Limburg	2