

**THE ACCESS TO THE COMMUNICATIONS INFRASTRUCTURE AND  
INFORMATION TECHNOLOGY IN THE ROMANIAN RURAL SPACE –  
REGULATION, INTRACOMMUNITY GAPS AND RECENT EVOLUTIONS**

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**Abstract:** *An essential element in the ensurance of a balanced territorial development of rural economies and communities, inclusively from the perspective of creating and maintaining the jobs, is represented by the basic infrastructure, in which, an important place is held by accessibility, the utilization and quality of information and communications' technology (TIC). TIC becomes more and more important for the national economy but also for the rural areas, be they individual or regarded as a whole, such that the access to TIC becomes a necessity. With implications in all spheres of activity in the national economy, respectively from agriculture, to industry, tourism or different services, TIC brings forth at national level the issue of allocation of financial resources oriented mainly towards this field, both in the urban environment and especially in the rural one. From this perspective, the present approach proposes itself the realization of a radiography of the access to TIC in the rural environment, with the accent put on the main regulations, as well as the present stage, through the reporting inclusively to the evolutions registered in other Member States.*

**Key words:** *basic infrastructure, TIC, rural environment, regulation.*

## **INTRODUCTION**

In the context of existence at the world level of a sustained development rhythm in the domain of information and communications technology, with important implications in all spheres of activity of an economy, generating, either directly, or indirectly, added value, but being, at the same time also a basic element of the local communities development, the approach to such an issue at the level of the Romanian rural environment is receiving special valences, at least from two points of view, respectively that of increasing the degree of technological endowment of these areals, as basis of investments' attraction, but also that of improvement of the living conditions and education of the rural population.

Without proposing ourselves in the present article a deep radiography, we consider as useful the presentation of Romania's place in the range of Member States from the perspective of the internet access (large range infrastructure), as well as the present stage of internet's penetration into the Romanian village, according to the regulation framework, the policies and strategies in this domain.

## **STAGE OF KNOWLEDGE**

The issue of the internet access in Romania has made the object of many researches, their results being subsequently transposed into development strategies and policies. Implementation of broadband communications is considered to be extremely important, with the aim of avoiding the risk of broadband internet being implemented only in areas with increased population density, leaving areas excluded, such as those in the environment rural.

In this context, it should be noted that one of the objectives of the strategy documents at national level [10] is to make available to all residents the possibility of

broadband access at far higher speeds of over 30 Mbps but also an increase in the number of families subscribing to over 100 Mbps Internet connections.

For example, a 2011 study by the Romanian Institute for Evaluation and Strategy (IRES) [2] highlighted the fact that more than half of the interviewed Romanians declared users of the Internet (52%), of which only 3% do not have access to the internet at home.

On contrast to the urban environment characterized by a higher modernity degree, but also by a higher informational absorption capacity, the rural environment has lately known a visible trend of improvement in this technological parameter.

However, there are significant differences between the rural areas from point of view of the speed of the internet network, the quality of the services supplied or the number of such services' suppliers. The unsatisfactory rate of penetration and use of the Internet is mainly due to low income households in rural areas, low household availability of computers, poor DSL coverage conditions, and poor wireless internet [12].

On the other hand, according to other studies [15], although there is a functional infrastructure and openness in rural areas in digital education, there are not yet enough available educational materials available for use.

Practically, compared to other Member States, the rural-urban gap is more pronounced in Romania than in the countries of Western Europe [1].

In order to meet the objectives of the Digital Agenda for Romania 2020, a plan of measures has been developed to estimate the need for broadband infrastructure investments for Next Generation Networks (NGN). This plan is mainly focused on the new generation of access segment, the new generation of the terminal segment aiming to highlight the necessary conditions for the development of existing backbones and backhaul.

The Romanian transport and distribution networks are at a development level that can be used and / or expanded for ultra-fast NGA connections. However, in the case of rural areas in Romania, significant additional development of distribution networks is needed to cover "white areas".

The studies made by the National Authority for Administration and Regulation in Communications (NAARC) [2], or by the World Bank [6] have put into evidence the need to strengthen the investment process in this field, which must contribute both to the facilitation of the access to internet in the un-covered areas (the so-called white zones), but also to the increase of the internet network speed.

Starting from the above considerations, the present approach is based on the informational support ensured by the Tempo-Online database of the National Statistics Institute [5], as well as on data and information from the statistics at community level (Eurostat) [4], as well as those found in different specialty studies.

## RESEARCH RESULTS

### *a) Considerations regarding population and the territory's administrative organization*

The elaboration of any strategy and policy has, among the starting points, information linked to the existent population in each area, but also to the way of territorial administrative.

Even if, at first sight the last element does not seem extremely important, this is getting significant valences, constituting the basis of local intervention, both from administrative point of view, but mainly that of financial resources' allocation, necessary for development.

From this perspective, we have to mention the fact that at the level of the year 2017, Romania had a population of 22.2 mil. inhabitants, with the domicile predominantly in the urban environment (56.4%). In the same year, the population in the rural environment was re-grouping 43.6% of the total population, three of the 8 Development Regions (North - East, South-Muntenia and South -West Oltenia) being regions predominantly rural, pthe share of population from these areals oscillating between 50.2% (South –West Oltenia) and 57.2% (South -Muntenia).

From the point of view of the territory’s administrative organization, in year 2017, in Romania there were registered 2,861 communes, with a total villages’ number of 12,487, to which there are added 470 villages pertaining to municipalities and towns, the regional distribution being given in the table 1.

**Table 1.**  
**The administrative structure of the rural environment in Romania, in the year 2017 (no.)**

	No. communes	No.villages afferent to communes	Average number of villages/commune	No. villages pertaining to municipalities and towns
<b>TOTAL</b>	<b>2861</b>	<b>12487</b>	<b>4,4</b>	<b>470</b>
NORTH-WEST	403	1752	4,3	48
CENTRE	357	1717	4,8	71
NORTH-EAST	506	2361	4,7	53
SOUTH-EAST	355	1405	4,0	43
SOUTH-MUNTENIA	519	1972	3,8	47
BUCHAREST - ILFOV	32	89	2,8	2
SOUTH-WEST OLTENIA	408	1949	4,8	121
WEST	281	1242	4,4	85

Source: Tempo-Online database , NSI, 2017,[5].

*b) The access to internet – gaps towards European Union*

Development and expansion of the internet networks in Romania had as effect, in the period 2007-2017 a significant increase of households connected to internet. Thus, from only 8% of the total number of households connected in the year 2007 it was reached, in 2017 to 74%, respectively an increase of over 8 times, Romania being outpaced, in dynamics only by Greece (from 7% in 2007 to 71% in 2017).

At the level of the year 2017, towards the community average of 83%, Romania is situating but on the 26-th place, over the average being situated 50% of the community States (Netherlands, Olanda, Luxemburg, Finland, Sweden, Great Britain, Denmark, Germany, Ireland, Austria, Estonia, Malta, Belgium, Czech Republic and Spain) (Table 2).

**Table 2.**  
**Evolution of the households' number connected to the internet (% from total households) at community level in the period 2007-2017**

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2017/2007 (%)
EU-27	42	48	56	61	67	72	76	78	80	83	85	102
Belgium	56	60	63	70	74	75	79	81	79	82	84	50
Bulgaria	15	21	26	26	40	51	54	56	59	63	67	347
Czech Republic	28	36	49	54	63	63	69	76	76	80	83	196
Denmark	70	74	76	80	84	85	87	85	84	92	92	31
Germany	50	55	65	75	78	82	85	87	88	90	92	84
Estonia	47	54	61	64	65	73	78	81	87	85	87	85
Ireland	31	43	54	58	65	65	67	80	83	86	88	184
Greece	7	22	33	41	45	51	55	65	67	68	71	914
Spain	38	44	50	56	61	65	69	73	78	81	83	118
France	49	57	63	66	70	77	78	77	76	79	79	61
Croatia	23	27	39	49	56	60	64	68	76	77	76	230
Italy	25	31	39	49	52	55	68	71	74	77	79	216
Cyprus	20	33	47	51	56	62	64	69	71	74	79	295
Latvia	32	40	50	53	59	67	70	73	74	75	76	138
Lithuania	34	43	50	54	56	60	64	65	67	71	75	121
Luxemburg	58	61	71	70	68	68	70	93	95	97	97	67
Hungary	32	41	50	51	59	66	69	73	75	78	82	156
Malta	44	55	63	69	75	77	79	80	82	82	85	93
Netherlands	74	74	77	80	83	84	87	94	94	95	98	32
Austria	46	54	58	64	72	77	80	79	81	85	88	91
Poland	30	38	51	57	61	67	69	71	71	76	78	160
Portugal	30	39	46	50	57	60	62	63	69	73	76	153
Romania	8	13	24	23	31	50	56	58	65	70	74	825
Slovenija	44	50	56	62	67	73	74	75	78	78	82	86
Slovakia	27	35	42	49	55	72	70	76	78	78	79	193
Finland	63	66	74	76	81	85	88	89	90	91	93	48
Sweden	67	71	79	83	86	87	:	87	83	89	93	39
Great Britain	57	62	69	:	80	86	87	88	90	92	93	63

Source: Eurostat, 2017, [4].

This aspect is put into evidence also by the index of the digital economy and society [13]<sup>1</sup> according to which, at the level of the year 2016, Romania has a global rating point of 0.35 which is placing it on the last place of the 28 EU Member States.

<sup>1</sup> Index of digital economy and society (IDES) is a composite index, elaborated by the European Commission, in view of assessing the progresses of the EU countries in the direction of a digital economy and society. This index is integrating a set of relevant indicators, structured around five dimensions: connectivity, human capital, the internet utilization, integration of digital technology and the public digital services (<http://ec.europa.eu/digitalagenda/en/digital-agenda-scoreboard>).

We must not omit that Romania is part of the group of countries being in a recovery phase of the gaps, because, although it still registers weaker results than the EU ones as a whole, it was rapidly developed in the last year and is getting closer to the EU average. Opposed to 2015, a more important percentage of the population is subscribed to the broadband networks also due to their high quality, but the low level of the digital competences and the confidence of the users seem to be a drawback for the country's digital economy's development. Comparatively to the year 2010, the connection to the mobile internet has known the most accentuated expansion towards the fix internet. Thus, Bulgaria, Romania, Netherlands, Hungary, Estonia and Malta are on the top of the Member States from the point of view of the dynamics of the access to the mobile internet. However, in ratio to the other Member States, comparatively to the 42 percentages of households which have access to the mobile internet Romania is situating under this average with 5 percents, the last position being held by Cyprus (1%) (Table 3).

**Table 3.**

**The access to the fix and mobile internet at community level (% from total households) in the year anul 2017 comparatively to 2010**

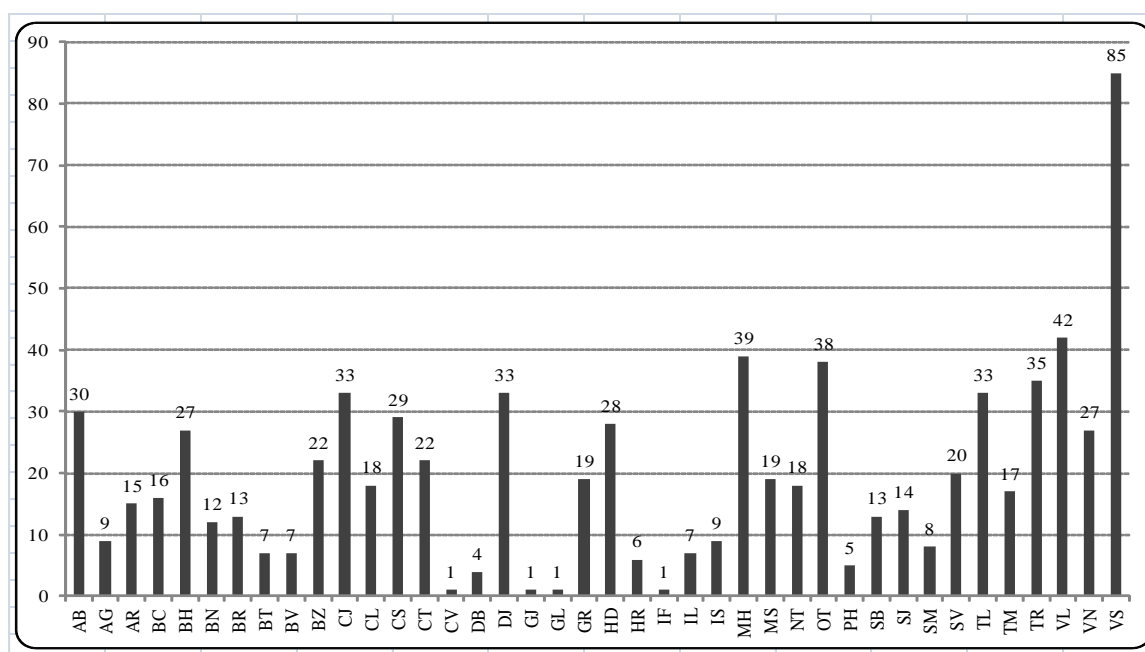
	Fix Internet			Mobile Internet		
	2010	2017	%	2010	2017	%
EU-27	57	75	31,6	10	42	320,0
Belgium	68	81	19,1	3	31	933,3
Bulgaria	26	59	126,9	1	46	4500,0
Czech Republic	52	73	40,4	2	21	950,0
Denmark	75	86	14,7	13	33	153,8
Germany	72	88	22,2	14	51	264,3
Estonia	61	78	27,9	4	72	1700,0
Ireland	45	74	64,4	14	43	207,1
Greece	41	69	68,3	2	11	450,0
Spain	54	73	35,2	7	64	814,3
France	65	71	9,2	9	35	288,9
Croatia	47	70	48,9	5	44	780,0
Italy	41	57	39,0	10	39	290,0
Cyprus	51	76	49,0	1	3	200,0
Latvia	51	64	25,5	4	24	500,0
Lituania	52	65	25,0	4	34	750,0
Luxemburg	69	94	36,2	9	27	200,0
Hungary	49	78	59,2	3	65	2066,7
Malta	68	84	23,5	4	49	1125,0
Netherlands	79	98	24,1	2	48	2300,0
Austria	48	71	47,9	23	63	173,9
Poland	51	61	19,6	10	39	290,0
Portugal	41	72	75,6	18	46	155,6
Romania	22	67	204,5	1	37	3600,0
Slovenja	58	77	32,8	19	72	278,9
Slovakia	42	70	66,7	13	35	169,2
Finland	61	57	-6,6	33	89	169,7
Sweden	71	78	9,9	28	63	125,0
Great Britain *	:	88	14,3	:	25	212,5

\* dynamics was calculated by ratio to the year 2011.

Source: Eurostat, 2017,[4].

c) *The access to the broadband infrastructure in the Romanian rural environment—projections, evolutions, trends*

The specialty analyses made by NAARC or MCIT have revealed that the traditional broadband services<sup>2</sup> are available mainly for the citizens and enterprises in more densely populated zones. Because of the high fixed costs, the unit costs are dramatically aggravated for the population in the zones with reduced density, becoming a major obstacle for the development of the broadband infrastructure. As effect, the networking (distribution) and access (last mile) from these zones and the connection to the magistral network are in-sufficient or lacking mainly in the rural zones, mountains, geographically in de-favour. In this context, the national level challenge is to expand the ray of action of this magistral of electronic communications into the so-called „white zones”<sup>3</sup> [7], by construction of distribution networks, following that these be completed by knots of local access realized by private operators. According to the available information on the MCIT website, Romania proposed itself to use structural funds, sense in which applied for the „RO-NET Project - Support for the foundation of broadband networks in the insufficiently served zones –the white zones”. Concretly, the national authorities have made the decision to use the structural funds available for the development of an infrastructure of state ownership which should be put at the disposal of the communication operators, on commercial bases and without the access restricting. Within this project, Telekom Romania will ensure the necessary infrastructure in a number of 783 localities in the rural (white zones), the repartition of which is shown in Figure 1.



**Figure 1. Number of localities included in the RO-NET project (white zones) per counties**

Source: Calculations on basis of MCIT data, [12].

An extremely important project at national level is represented also by the development of the broadband<sup>4</sup> for the next generation networks (Next Generation

<sup>2</sup> Speed of data download was established at 1 Mbps for the Residential segment and 4 Mbps for the economic agents and public institutions.

<sup>3</sup> Zones in which there are no operators to supply internet services.

<sup>4</sup> Digital Agenda Digitală 2020 proposes the increase of this speed of data transfer up to at least 30 Mbps until 2020.

Network - NGN<sup>5</sup>) [9], in view of accomplishing the objectives of the Digital Agenda for Romania 2020. Concretely, it is promoted the building of optic fibre networks with national coverage and with a large spreading of the distribution points, as close to the final user as possible and adequate symmetry and interactivity levels, to guarantee a better transmission of information bothways.

Elaboration and implementation of such projects/programs had at its basis multiple assessments made inclusively with external support. In this sense, it is to be remarked the Report elaborated by the World Bank in the year 2015, report regarding the typologies of communities/geographical zones and the options for investment interventions in the broadband networks and NGN [3].

According to this document, rural zones are extremely heterogeneous, the villages being classified by relief forms (plain, plateau, mountain), number of inhabitants, distance to the town and administrative type (central or peripheric). Around 88% of the communes have a central village and between 1 and 40 peripheric villages. The other 12% of the communes are including only one village (central). The central villages are tending to concentrate the administrative and institutional resources of the commune (Townhall, doctor's office, school, library, post office and police station). The public infrastructure, needing modernization in the majority of the rural zones, is significantly poorer in the periphericthe counties Vaslui and Bacău).

Other 18% are from the Region Centre (8% are coming from only one county, Alba), while 15% are from the Region North-West. În the Region North-East there are predominant the whitwe villages NGN (without 3G+),while the white villages NGN with networks 3G+ are very many in the Centre. In the World Banks opinion, seven counties could be considered prioritary for intervenion, respectively Alba and Cluj (Centre), Hunedoara (West), Vaslui, Bacău and Iași (North-East) and Buzău (South -East).

Per total, these counties are contributing with 36% from all white villages NGN in the country (38% of these without networks 3G+ and 33% of these with networks 3G+), as well as with 42% of the white spaces (no connection and no operator). At the same time, in these counties, the process of broadband development seems to be the slowest in the country, as the white spaces NGN reprezent over 60% of all villages, in each of them.

Other counties which are remaining behind with the broadband development, but with a low contribution because of the total lesser number of villages, include: Mehedinți (South-West), Sălaj and Bistrița-Năsăud (North-West), as well as Constanța (South -East).

Another villages' category is represented by the so-called **grey villages NGN<sup>6</sup>**. In the World Bank opinion, the grey villages NGN are lesser and tend to be very concentrated territorially. Over two thirds (65%) from all villages AnuD (Access-not-Distribution ) are situated in nine counties: Iași, Vaslui and Bacău (both from North-East), Buzău (South-

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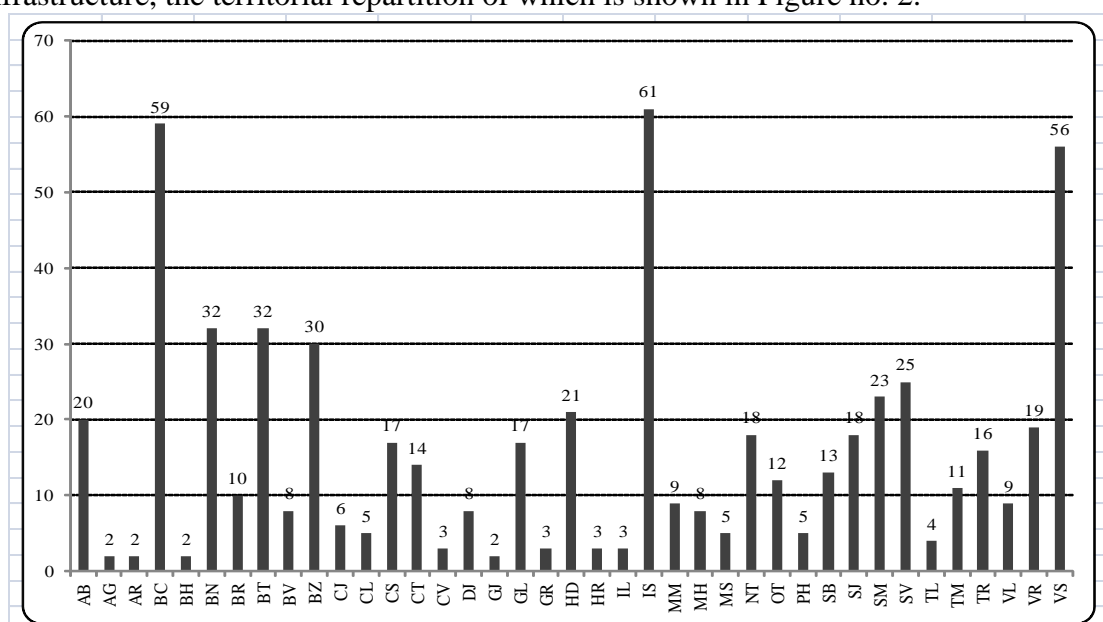
<sup>5</sup> Network based on commutation of packages, able to supply electronic communication services and utilize multiple transport technologies of broadband, with the ensurance of quality of services in the whole network, within which the functions associated to services are independent from the transport technologies with which they relate. This network type is able to supply the un-restricted access of the users to different services' suppliers. Also, they support the general mobility, characteristic which will let the consequent and ubiquitous supply of services to the user.

<sup>6</sup>This definition includes two categories, respectively:

- a) zones AnuD or Access-not -Distribution are villages in the rural and urban environment in Romania, which have only local knot networks for communications in broadband with a download speed of 30 Mbps or over and which are not involved in broadband projects financed from public (either by e MARD or MSI);
- b) zones DnuA or Distribution-not Access are villages in the rural and urban environment in Romania, which have only backhaul connections for broadband communications with a download speed of 30 Mbps or over and which are not involved in broadband projects financed from public funds (either by MARD or by MSI).

East), Prahova, Călărași and Dâmbovița (South -Muntenia), Caraș-Severin and Timiș (West). Almost half of all villages DnuA (Distribution -not-Access) (46%) are situated only in three counties, respectively : Prahova (South Muntenia), Sălaj (North -West) and Suceava (North-East). The most intense development of the networks DnuA took place in the region South-Muntenia, though. At last, the third category of villages analysed are the **black villages NGN<sup>7</sup>**, which are spread in all counties and all regions. Though, seven counties accumulate 37% of all black villages NGN in Romania. These counties are: Argeș and Dâmbovița (South -Muntenia), Vâlcea and Gorj (South -West), Bihor (North -West), Mureș (Centre) and Suceava (North -East). The same counties are but the most advanced in the development of broadband services as the share of black villages NGN represent over 60% of all component villages.

Synthesizing, at regional level, the most intense development of fix broadband networks of great speed in the country took place in regions: South-Muntenia and Bucharest -Ilfov, at the other extreme, respectively the weakest development, being situated the regions: West, North-East, Centre and South -East. Following the analysis of the World Bank there were identified 611 villages for the development of broadband infrastructure, the territorial repartition of which is shown in Figure no. 2.



**Figure 2. Territorial repartition identified for the broadband infrastructure development, 2015**

Source: Calculations on database from the World Bank Report, 2016, [3].

## CONCLUSIONS

The structural modifications intervened in the national economy were manifested with different intensities and effects in the urban environment in comparison to the rural one. The major gaps registered by the majority of the demo-economic and social

<sup>7</sup>All villages in the rural and urban environment in Romania, which are neither white zones NGN or grey zones NGN. Thus, the black zones NGN' include also the villages involved in the broadband projects financed from public funds, either they are MARD projects, through Measure 322, or the Ro-NETproject implemented by MCSI.

indicators in the rural opposed to the urban areals have their origin on one hand, in the structures of each own areal, regardless their nature, and on the other side they are derived from the intensity of the investment process oriented towards the rural environment.

Anyhow, in the last period of time, at least in ratio to the basic infrastructure, it is to be remarked an accentuated development rhythm in the rural, with positive effects upon the life quality and the attraction of investments in view of sustaining some activities, generating value added.

The basic infrastructure's development in the rural environment, regardless its nature, the networks of public utilities or access to internet of great speed ensure, together with the spine of each areal –the population, the basic elements of a sustainable development of these areals.

Regardless the financing source of the basic infrastructure's development, in the integrality of its component elements, either own, or attracted, through structural funds, respectively through the financing measures by the NRDP [14], MCSI, etc, it is necessary that this process be intensified, for the recovering of the gaps towards the other Member States, the actions and the measures for implementation by the decidents being essential in this goal.

The current primary law framework [11] aims to help facilitate the development of electronic communications networks and physical infrastructure elements needed to support them by taking measures to speed up the exercise of the right of access to property and to remedy the inefficiencies that affects the process of expanding electronic communications networks.

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