Connectivity and digital appropriation for climate resilience in rural areas

A climate justice approach from the Global South to the twin transitions.

By Paz Peña O., Latin American Institute for Terraforming.
May 2023[1].

I. Introduction

For several periods, the Intergovernmental Panel on Climate Change (IPCC) has warned that humanity is about to cross a red line. The scientific evidence is unequivocal: the temperature of our planet has risen by 1.1°C above pre-industrial levels, and the changes are already perceptible to everyone in the world. If we are to limit warming to 1.5°C, a still manageable scenario for humanity, greenhouse gas reductions must be immediate, rapid, and large-scale, which means, primarily, not only switching away from fossil fuels but also switching to clean energy. Unfortunately, the signals are weak from the significant greenhouse gas emitting countries, and all indications are that we are heading for a 2.4°C increase by the end of the 21st century.[2] Reaching 3.0°C would be catastrophic, especially considering that for the scientific community, we are already starting the sixth mass extinction that will change the known scenarios of humanity forever.[3]

As the figures show, when it comes to the climate crisis, neither the responsibilities nor the consequences are equally shared. The most impoverished people and countries suffer the most from this crisis, even though they bear the least responsibility. This crisis has been caused by the industrial development of developed countries in the first place and displaced peripheral countries by disrupting production chains. Thus, in high-income countries, where only one-sixth of the world's population lives, it is estimated that they emit 44 times more CO2 than those with lower incomes.[4]

In this context, climate justice is fundamentally about paying attention to how climate change impacts people differently, unequally, and disproportionately and remedying these injustices fairly and equitably. Its objectives are to reduce marginalization, exploitation, and oppression and to strengthen equity and justice. In other words, climate justice denounces reductionist ways of viewing the problem of global warming as a scientific or merely economic issue and, in this critical approach, relocates the problem to moral and justice

[1] This report was prepared in the context of a joint project with TEDIC and Comité de Mujeres Kuña Aty de Táva Guaraní (both Paraguayan organizations) with the Latin American Institute of Terraforming. This is an unofficial translation. The official version of the document is in Spanish here https://terraforminglatam.net/conectividad-y-apropiacion-digital-para-la-resiliencia-climatica-en-zonas

[2] Reuters. 2021. World heading for 2.4C of warming after latest climate pledges -analysts https://www.reuters.com/business/cop/world-track-24c-global-warming-after-latest-pledges-analysts-2021-11-09/

[3] CNET. 2022. Researchers Say We're in a Sixth Mass Extinction. This Time, Humans Are the Culprit https://www.cnet.com/science/features/researchers-say-were-in-the-sixth-mass-extinction-heres-why-it-matters/

[4] elDiario.es. 2019. Cuanto más rico, más contamina: por qué los hogares con más dinero de España emiten el doble de CO2 que los más pobre https://www.eldiario.es/sociedad/contamina-hogares-dinero-espana-co2_1_1194390.html

concerns. In this, intersectional feminism plays a key role, as it draws attention to the power relations that converge to affect the climate and ecological crisis, with gender, race, class, and other social hierarchies crucial to the analysis of climate justice.

Although these injustices are part of the public policy discussion around the climate and ecological crisis,[5] climate justice is often conceived of as an afterthought to a policy rather than its central objective, resulting in people being forgotten in favour of purely economic transition objectives. This is the case of an increasingly popular concept that directly concerns digital policies: twin transitions. With this latter approach, industrial economies seek to link the urgent transition to green energy that the world needs with the digitalisation of the economy, on the understanding that both transitions (green and digital) are equally dependent on each other and will be the key to climate mitigation. **This paper aims to understand how the digital transition, in a context of twin transitions, must be thought through from the perspective of climate justice because otherwise, those left furthest behind by digitalisation, who are also those who suffer the most from the climate and ecological crisis, will once again be forgotten.**

To do so, it not only critically reviews the concept of twin transitions but also focuses on the connectivity needs of the rural women's community of Táva Guaraní in the department of San Pedro, Paraguay. In a discussion on twin transitions that are being driven from the Global North, we consider it essential that public policy that seeks to bridge the transition to green energy with the digitalisation of the economy not only listens to the communities most affected by the climate crisis and the lack of meaningful digital connectivity but is an important inspiration for putting justice at the heart of twin transitions. For this reason, this paper also focuses on providing some public policy recommendations for stakeholders.

II. The twin transitions

A. Their geopolitical momentum

For the World Economic Forum (WEF),[6] the twin transitions refer to two critical transitions simultaneously: the shift towards a low-carbon economy to address climate change and the increasing use of digital technologies in all life and work. For WEF, a dual transition approach recognises a vast, largely untapped opportunity for technology and data to drive sustainability goals. So rather than treating digital and sustainability in isolation, a twin transitions strategy combines these critical functions to unlock considerable benefits in terms of efficiency and productivity.

In this context, the most serious driver of twin transitions is the European agenda, which has put this issue at the top of its priorities for some years now.[7] For example, the "New

[5] ONU - Programa para el medioambiente. 2013. La justicia climática se beneficiará de cambios transformacionales por nueva resolución de la ONU https://www.unep.org/es/noticias-y-reportajes/reportajes/la-justicia-climatica-se-beneficiara-de-cambios-transformacionales

[6] World Economic Forum. 2022. What is the 'twin transition' - and why is it key to sustainable growth? https://www.weforum.org/agenda/2022/10/twin-transition-playbook-3-phases-to-accelerate-sustainable-digitization/?DAG=3&gclid=Cj0KCQjwsIejBhDOARIsANYqkD1lVZNMkR7MMWOsivvnZrVl3RHIxNom0SzrR-NXNCMNek-Gcw0g9EQaAiW6EALw_wcB

[7] European Commission. 2022. Towards a green & digital future https://publications.jrc.ec.europa.eu/repository/handle/JRC129319

Industrial Strategy for Europe 2020" was the first strategic document of the European Commission (EC) that explicitly states the objective of a dual digital and green policy. There, the double transition is depicted as an inescapable and pervasive process that "will take place in an era of shifting geopolitical plates affecting the nature of competition". Later, the EU Green Pact is established as the first regional strategy to unify the twin transformations of digitalisation and sustainability.

The EC has proclaimed that "competitive sustainability" is the continent's guiding principle for the future, and along the same lines, the transition towards a more sustainable Europe from the economic, environmental and social perspectives must go hand in hand with the transition towards digitalisation.[8] On the one hand, the green transition is understood as the fundamental change in production and consumption models in order to live within planetary limits, which, they affirm, must also be fair and inclusive. On the other hand, unlike the green transition, the digital transition is not primarily driven by necessity but by the enormous new opportunities it creates, particularly concerning the change needed to shift to green energy. For example, it can facilitate the management of more complex energy grids, thus enabling higher shares of renewable energy. However, the green and digital transitions can be mutually reinforcing in many areas, but they do not always coincide. This is why the concept of "twin transitions" seeks to bring the two transitions together, which could accelerate the necessary changes and bring societies closer to the required level of transformation.

However, twin transitions in the EC are not born out of social justice but rather an economic strategy with clear geopolitical overtones. The Commission has recognised that the twin transitions are an opportunity to diversify and strengthen Europe's energy sources and build greater capacity and independence in data storage and processing on the continent. In other words, the unusual push for the idea of twin transitions can only be understood with the geopolitical consideration of the struggle for economic hegemony in the 21st century of the United States, China and the European Union. As Santaniello, El-Shal & Bouckaert (2022)[9] argue: 'The twin-transition project embodies a geopolitical dimension that epitomises the EU's aspirations to establish itself as a transformative power in order to establish itself as a global actor'.

Within this geopolitical framework of the twin transitions, the EC's justice concerns are limited to recognising that one of the main challenges of the two transitions is to ensure they are equitable, inclusive and just. For the Commission, this means:

- Protecting those who may be adversely affected by the necessary changes.
- Making the benefits of the twin transitions accessible to all ensures social justice, as the perception of fairness and transparency is an essential factor for social acceptance. For example, a successful digital transition requires that connectivity is accessible to all, regardless of location, income, education level or age.
- Just transition also encompasses ethical concerns related to the twin transitions. For example, there are ethical concerns about using Artificial Intelligence, such as the

[8] Comisión Europea. 2020. Una estrategia para las pymes en pro de una Europa sostenible y digital https://eur-lex.europa.eu/legal-content/ES/TXT/HTML/?uri=CELEX:52020DC0103

[9] Mauro Santaniello, Amira El-Shal, and Reinhilde Bouckaert. 2022. The EU and North Africa: Towards a Just Twin Transition? https://feps-europe.eu/wp-content/uploads/2022/11/FEPS_PS_The-EU-and-North-Africa-Towards-a-Just-Twin-Transition-1.pdf

lack of transparency, its ability to reproduce biases or whether it can be responsible for decisions in the public sector.

It is unclear whether these social justice concerns have a planetary boundary - thinking that the European market is based on global value chains - or only at the level of the inhabitants of that continent.

B. Apprehensions of the concept

It is striking to see how the concept of twin transitions has gained traction in recent years on the global economic and political agenda beyond the European Union, but not without raising certain caveats, both regarding the limitations of the concept itself and its climate consequences.

The fundamental point is that the question remains whether a green transition and a digital transition are a winning pair for the environment or whether one transition risks inhibiting the other. Bianchini et al. (2022),[10] a study focusing on different regions in Europe shows some doubts about the effectiveness of the "twin" transition in supporting greenhouse gas (GHG) emissions in all cases. While the local development of green technologies reduces GHG emissions, the local development of certain digital technologies (particularly the more energy-intensive applications) negatively affects the environment, which is only partially mitigated in regions sufficiently endowed with green technological know-how. Thus, for these authors, stimulating digital transformation through a "one-size-fits-all" approach can seriously affect the environment in the target regions.

Analysing the twin transitions in Europe, Fouquet & Hippie (2022)[11] indicate that, at similar levels of economic development, the digital transition tends to be substantially faster than the transition to green energy, suggesting that there may be fundamental differences between the communication and information and energy markets. It is, therefore, crucial to consider how to accelerate low-carbon energy transitions to align them with the ongoing changes associated with ICTs. Otherwise, the digitalisation process will proceed without decarbonising on the current course. This imbalance in the twin transitions creates the need to formulate policies that allow the lagging industry (i.e. low-carbon energy) to develop. Moreover, the authors recognise that the twin transitions are framed by the belief that economic growth is the answer to the climate crisis, which is certainly within a framework of uncertainty.

Also, as some environmental experts have pointed out, the framing of considering only two aspects of our current crisis (green energy and digitalisation) leaves out a fundamental issue: people. That is, it does not include the crisis's social, human and generational aspects. It also points to a need for indicators to improve essential elements of digitalisation on the

[10] Bianchini, S., Damioli, G. & Ghisetti, C. The environmental effects of the “twin” green and digital transition in European regions. Environ Resource Econ 84, 877–918 (2023). https://doi.org/10.1007/s10640-022-00741-7

[11] Roger Fouquet & Ralph Hippe. 2022. Twin transitions of decarbonisation and digitalisation: A historical perspective on energy and information in European economies, Energy Research & Social Science, Volume 91, 102736, ISSN 2214-6296, https://doi.org/10.1016/j.erss.2022.102736.

environment, such as consumption management, education and practices to mitigate e-waste, energy use and data risk (Dixon & Milanes, 2022).[12]

From the Global South, analyses of the prospects for twin transitions are less promising. First, there are very few studies on how digital technologies support environmental improvement in firms, especially at the level of their insertion into global production chains. In fact, Lema & Rabellotti (2023)[13] argue that, in the Global South, the digital transition and the green transition are not only not equal twins but are only related through the "extended family" (they are mainly limited to certain digital technologies and specific types of environmental upgrading).

Analysing how this affects North Africa, Santaniello, El-Shal & Bouckaert (2022)[14] note, in particular, how this agenda of the digital transition is designed around Europe's objectives and strategies without yet building a shared plan with that region. In this sense, there is caution in possible cooperation between regions if the EU anchors the twin transitions primarily in securitisation and geopolitical considerations, as has been the tenor since the Russian-Ukrainian war. In light of the ambitious scope of the twin transitions, the authors argue that developing a sustainable and inclusive strategy is essential.

III. The challenges of the digital transition in the Global South

In a report by Inter-American Development Bank (IDB) consultants on the opportunities of the twin transitions for Latin America and the Caribbean, Cathles et al. (2023)[15] take for granted the carbon footprint reduction benefits of digital technologies and support the idea that digitisation is an opportunity for climate change monitoring, mitigation and adaptation in the region. However, they caution that digital technology adoption among businesses, especially smaller ones, is very low compared to more advanced regions. It is also worrying because the gaps tend to be exacerbated as the sophistication of digital technology increases, slowing down the twin transition as a whole because leading firms in global value chains are increasingly dependent on greener suppliers whose production methods can be tracked and verified (typically through digital technologies), so suppliers will need to meet green and digital standards to participate in the global economy.

[12] Pam Dixon & Valeria Milanes. 2022. The Twin Transition from a Global Perspective: Framing the debate https://www.worldprivacyforum.org/wp-content/uploads/2022/12/Twin_Transition_Report1_WPF_ADC_13December2022_fs.pdf

[13] Rasmus Lema & Roberta Rabellotti. 2023. The Green and Digital Transition in Manufacturing Global Value Chains in Latecomer Countries. United Nations Conference on Trade and Development https://unctad.org/system/files/non-official-document/tir2023_background1_en.pdf

[14] Mauro Santaniello, Amira El-Shal, and Reinhilde Bouckaert. 2022. The EU and North Africa: Towards a Just Twin Transition? https://feps-europe.eu/wp-content/uploads/2022/11/FEPS_PS_The-EU-and-North-Africa-Towards-a-Just-Twin-Transition-1.pdf

[15] Alison Cathles, Gina Cardenas, Pauline Henriquez Leblanc. 2023. Opportunities and Challenges for the Twin Transition in Latin America and the Caribbean. Inter-American Development Bank, Washington, DC USA.

Similar to this line, UNCTAD (2023)[16] analysed the twin transitions from developing countries and their insertion into global value chains and concluded that, so far, digital technologies have needed to be faster to diffuse in most developing economies. In fact, the manufacturing firms most likely to use Industry 4.0 technologies[17] are in the more advanced economies of developing countries. In contrast, countries with low-skilled workforces are less likely to benefit. Therefore, to promote the dual green and digital transition, lagging countries will need to, among other things:

- **Building the infrastructure**

As these technologies advance, all countries will need more robust digital infrastructures, particularly high-speed, high-quality internet connections. However, there are significant technological inequalities: in fixed broadband connection, the average speed observed in developed economies (about 115 megabits per second) was almost eight times higher than in the least developed countries (LDCs) (about 15 megabits per second). But for UNCTAD, the technology gap is also visible within the same groups of countries and between rural and urban areas. For example, a 2021 UNCTAD survey revealed that 16 per cent of the rural population in LDCs had no access to any mobile network, and 35 per cent could not connect using a mobile device. Another constraint is the high cost of connectivity relative to income.

For UNCTAD, developing country governments must ensure high-quality internet access in a global economic scenario moving towards twin transitions. This implies public and private investments in ICT infrastructure and regulations fostering competition in the telecommunications sector. Governments must also address the connectivity gap between small and large businesses and urban and rural regions.

- **Building digital skills**

UNCTAD has identified skills at three levels: to adopt technologies for their basic use and create new ones.

For developing countries, it is imperative to have the ability to adapt and modify technologies, as they are likely to be used in circumstances different from those in which they were originally developed. Therefore, governments need to support enterprises, including SMEs, to help them build digital skills in areas such as market research, product development, sourcing, production, sales and after-sales services. Particular attention should be paid to women in small, informal and artisanal micro and small enterprises, especially women entrepreneurs.

To these two measures just highlighted, UNCTAD adds the creation of standards and regulations for these twin transitions (such as data privacy), aligning digital strategies with green strategies and, not least, the public sector, in partnership with international donors and development banks, should invest in these projects to demonstrate the effectiveness of undertaking the twin transitions.

[16] TECHNOLOGY AND INNOVATION REPORT 2023. United Nations publication issued by the United Nations Conference on Trade and Development https://unctad.org/system/files/official-document/tir2022_en.pdf

[17] Also known as the Fourth Industrial Revolution, Industry 4.0 (4IR) is a term coined in 2016 by Klaus Schwab, founder and executive chairman of the World Economic Forum. The convergence and complementarity of emerging technological fields, such as nanotechnology, biotechnology, new materials and advanced digital production technologies, characterise it.

IV. Just digital transition and Rurality in the Global South: the case of Paraguay

So far, the visions of twin transitions presented above do not focus on people as subjects of rights in the context of climate and ecological crisis and are only limited to their relationship with the economic system and, particularly in the case of the Global South, with their participation in the global production chain. Nevertheless, although, as we have seen in this paper, the concept has important criticisms, these have not prevented the idea of twin transitions from being amplified globally. This implies, then, the indisputable challenge of raising the dimension of justice in this double transition. To advance in this, TEDIC, Organización Kuña Aty, and the Latin American Institute of Terraforming focus on providing recommendations for justice in the digital transition in the context of twin transitions.

In other words, if digitalisation can be a crucial component for a planet in a climate and ecological crisis, it is time for digital governance at international, regional and national levels to drive key questions such as: What kind of digitalisation? Under what conditions? For whom? How is it developed? The communities that have contributed the least to the climate crisis and suffer the most from its consequences, and which, in turn, enjoy the least from the fruits of digitalisation, must have a crucial voice in the digital transition if we want to speak of justice in this double transition.

Anchored by this belief, we conducted a focus group with 15 women from the rural women's network Organización Kuña Aty of the Táva Guaraní community through a semi-open questionnaire. This focus group was conducted in person in the department of San Pedro, Paraguay, in December 2022. The objective of this activity was to understand better what is a just digital transition in the era of a climate and ecological crisis when rural women of the Táva Guaraní community do not have quality connectivity that would allow them to access information and communication that would help them mitigate the alarming effects of the climate crisis.

Through their reflection, it is possible to understand the role of multiple stakeholders in digital governance and, in particular, the need for innovative and decisive public policies when guaranteeing sustainable connectivity that ensures the human rights of people in rural areas at a time of the greatest crisis humanity has ever experienced.

A. Summary of findings

The Department of San Pedro in Paraguay is nationally known for its soybean plantations and economic dependence on unsustainable cattle ranching. In addition, the effects of climate change on its population have been widely studied, mainly due to drought, which makes the area food insecure, in a department where more than 36% of the population lives in poverty, especially in rural areas.[18]

[18] Grassi, B., Vázquez, F. y Rodriguez, R. 2020: Evidencias científicas e impactos económicos del cambio climático en el departamento de San Pedro. MADES-STP. Asunción, Paraguay. https://www.stp.gov.py/v1/wp-content/uploads/2020/10/San-Pedro-Evidencias-cient%C3%ADficas-e-impactos-econ%C3%B3micos-del-cambio-clim%C3%A1tico.pdf

Táva Guaraní is a rural peasant community in the district of Santa Rosa del Aguaray in the department of San Pedro, made up of some 200 families, in a territory of five thousand hectares, including areas that are not populated, and which is mainly dedicated to the cultivation of food crops. The women in the focus group recognise that their crops are deeply affected by the climatic and ecological crisis, with the appearance of irregularities in the climate (from periods of drought to periods of intensive rainfall) that they did not see in their childhood. They also point to the presence of pests. By affecting their crops, the crisis directly impacts their economic reality, food security, and sovereignty, as many food diversities disappear. One focus group participant warns:

> "Poverty may be all over Paraguay; it is not only here. Poverty is everywhere in the countryside. And if the countryside does not produce, people in the city are also affected".

Indeed, according to Paraguay's National Plan for Adaptation to Climate Change, "rural and indigenous populations dedicated to agriculture and living in poverty would be the most affected, considering that it is a peasant and indigenous family farming that has the least resources, technologies and investment to face the climate crisis" (p.19).[19] This decrease in adaptive capacity puts the community in a vulnerable position, in which the only option for many is to cede part of their properties to local grain producers who have the appropriate modern machinery to work the land, which almost always means ceding to soybean monoculture that has diverse adverse environmental and cultural effects.[20] For this reason, one of the sub-objectives of the Paraguayan plan for adaptation to this crisis is to increase the capacities of women belonging to rural communities and indigenous peoples to raise awareness and take action on the present and future impacts of climate change, which affect food production for self-consumption and commercialisation.

In this context, the rural women of Táva Guaraní recognise that internet connection is fundamental for their community, as it allows them to communicate with each other and nearby neighbourhoods, to share and access relevant information about their crops and other interests and, of course, to educate themselves on various subjects, primarily through learning about the experience of other countries. One focus group participant reflects:

> "I, for example, have a problem in my vegetable garden because of the little bugs that attack it. And Ali, the lady who comes to teach us to dance, usually sends me information when she finds out about the blight that attacks tomatoes. It's a kind of fungus. And she usually sends me these things. She tells me where I can go [on the internet] to find out".

Yet their internet connectivity is extremely difficult: they are restricted to buying a limited data plan that usually only lasts a few days. They spend days without connectivity because the most significant barrier they see is the cost of that connection. Moreover, when they buy data packages, this connectivity is also of poor quality, hindering access to more data-

[19] Dirección Nacional de Cambio Climático. 2022. El Plan Nacional de Adaptación al Cambio Climático 2022-2030 (PNACC 2022-2030) disponible para todo público http://dncc.mades.gov.py/archives/noticias/el-plan-nacional-de-adaptacion-al-cambio-climatico-2022-2030-pnacc-2022-2030-disponible-para-todo-publico

[20] Corporate Europe Observatory. 2009. Soja "responsable" en Paraguay: El Grupo DAP y el avance de los monocultivos de soja en San Pedro https://www.biodiversidadla.org/Documentos/Soja_responsable_en_Paraguay_El_Grupo_DAP_y_el_avance_de_los_monocultivos_de_soja_en_San_Pedro

demanding platforms or other services; in fact, almost all of their internet connection is limited to a messaging platform such as Whatsapp. The organisation Kuña Aty has tried to make representations to the local authorities to improve their connectivity without success. In addition, they have almost no access to their own computers, and their mobile phones have enormous technical limitations. It is also recognised that children use the internet very little because of these limitations and that they only sometimes connect via mobile phones; they also detect a gender gap in the use of these technologies, especially between boys and girls: the latter tend to have less access to technologies because there is a perception that the internet is an unsafe place for them.

The accounts of rural women in Táva Guaraní coincide with official figures. Paraguay ranks second to last in the number of people using the internet in Mercosur, with a pronounced gap between urban and rural areas and between the highest and lowest income quintiles.[21] Data from the 2021 Permanent Household Survey (Encuesta Permanente de Hogares, EPH)[22] on access to digital tools indicates that 77% of the population aged ten and over used the internet in the last three months, or around 4 million 526 thousand people. By area of residence, 83.3% of users are in urban areas and 65.8% in rural areas. The population of the capital, Asunción, was the one that used the internet the most, with 88.7%, and at the departmental level, San Pedro is at the lowest national level, with only 60.8% of users. On access to digital tools, the report indicates that 4.2 per cent of households have access to a fixed-line telephone, and 96.8 per cent have access to a mobile phone. However, only 26.8% own a computer or notebook.

While Paraguay is still particularly vulnerable regarding connectivity, the Latin American picture is not much better. According to UNDP's regional director for Latin America and the Caribbean, Luis Felipe López-Calva,[23] despite significant advances in broadband coverage in the region and the massive use of mobile phones, the majority of the population is far from having the tools, knowledge and opportunities to use digitalisation as an engine to improve their living conditions. The vulnerability of access is still enormous due to high connection costs and the lack of broadband access and computers suited to today's digital tasks, which means that little use is made of the internet, leading to a worrying skills gap. Moreover, according to a study by the CAF Observatory for the Digital Ecosystem 2020, the digital divide is worsening as internet access in Latin American households is limited to communication tools (chats) and social networks. A composite household digital resilience index (calculated on the use of the internet to download health apps, educational apps, conduct e-commerce transactions and use fintech[24], where an index of 30 is considered limited) shows that the Latin American weighted average is 30.70 (on a scale of 1 to 100), while OECD countries reach 53.78. Paraguay, on the other hand, only scores 16.9.

[21] MarketData. 2022. El acceso a internet como indicador de desigualdad socioeconómica, en Paraguay https://marketdata.com.py/laboratorio/analisis/el-acceso-a-internet-como-indicador-de-desigualdad-socioeconomica-en-paraguay-82394/
[22] Instituto Nacional de Estadísticas. 2022. Acceso a las TIC en Paraguay https://www.ine.gov.py/news/news-contenido.php?cod-news=1169
[23] Luis Felipe López-Calva. 2021. “Estás en Mute”: Porque el acceso a Internet no es suficiente para la digitalización inclusiva de América Latina y el Caribe. PNUD. https://www.undp.org/es/latin-america/blog/graph-for-thought/%E2%80%9Cest%C3%A1s-en-mute%E2%80%9D-porque-el-acceso-internet-no-es-suficiente-para-la-digitalizaci%C3%B3n-inclusiva-de-am%C3%A9rica-latina-y-el-caribe
[24] Digital technologies for financial processes

V. Policy recommendations: towards digital connectivity and ownership for climate resilience in rural areas

The case of the rural women of Táva Guaraní demonstrates that the challenges of twin transitions in the Global South - uncritically adopted - are manifold. The agencies of the Global North and developed countries pushing this concept in the name of their climate goals - or even for their own economic and geopolitical ambitions - have buried an obvious question for climate justice: how does this public policy ensure that it does not affect the people who suffer the most from climate consequences and who are often the ones who enjoy the fruits of digitalisation the least? And indeed, due to the global value chain of today's economies, the twin transitions will end up putting more pressure on the economies that have contributed the least to the climate crisis and will increase the digital skills gap of people, especially those living in the rural world. So who pays the costs of the twin transitions? Sadly, the same people. If, of course, nothing is done.

In this framework, general public policies are needed that can help developing countries to consider a just digital transition in the era of the climate and ecological crisis, not only internally - through concrete measures in line with their reality and needs - but also in their relationship with developed countries that are driving the double transition agenda, so that they strongly support a just digital transition in countries in the rest of the world.

While the challenges for developing countries in both transitions are enormous, from building infrastructure to building competencies for Industry 4.0 technologies, considering the needs of rural women in Táva Guaraní, this paper will focus on the challenges of connectivity and digital appropriation for climate resilience in rural areas. Otherwise, we believe this is a fundamental step to scale up on all the challenges ahead of the double transition.

As the International Telecommunication Union (ITU) has recognised, internet connectivity infrastructure in landlocked countries such as Paraguay is complicated, increasing connection costs and affecting the development of its economy.[25] The State of Paraguay has sustained various plans to improve connectivity with the country's geographic and economic conditions, including its new National Telecommunications Plan (PNT 21-25).[26] However, in times of climate and ecological crisis, it is crucial to move forward decisively and urgently with the following measures:

- **Develop info centres in rural areas with a focus on climate resilience:**

The creation and installation of info centres will accelerate the arrival of essential services to populations in remote and underserved areas thanks to broadband. Furthermore, as the ITU has recommended to Paraguay, these spaces are an excellent option to accelerate the use of new technologies by people living in remote and underserved areas.

[25] ITU. 2017. Países en desarrollo sin litoral (PDSL) de América – DESAFÍOS Y OPORTUNIDADES EN MATERIA DE CONECTIVIDAD PARAGUAY. https://www.itu.int/dms_pub/itu-d/opb/ldc/D-LDC-LLDC_AM.02-2018-PDF-S.pdf

[26] Por la cual se aprueba el Plan Nacional de Telecomunicaciones de la República del Parauay para el período 2021-2025 (PNT 21-25) https://www.conatel.gov.py/conatel/wp-content/uploads/2022/07/2021-rd-2246-pnt-2021-2025.pdf

But they are not only a space for connecting to the internet; they are also spaces for learning digital appropriation skills, especially for adults in rural areas, and for creating non-virtual networks, making them particularly valuable for accessing and sharing information on climate resilience on the internet and among rural communities. Thus, these spaces should not only be planned, deployed and supported by public policy but are a vital opportunity for national climate crisis policies and related private and community initiatives to be deployed territorially in rural areas in conjunction with digitisation policies.

In this sense, rural communities must be not only passive subjects that receive information but fundamentally, they are active agents in documenting their situation, creating content and technology in their language and seeking new economic opportunities (with particular attention to women in small, informal and artisanal micro-enterprises) that help their climate resilience, as other experiences in Latin America show,[27] and which also demonstrates that rural communities can have the capacity to adapt and modify technologies.

- **Community network development policy for climate resilience:**

Community wireless networks are communications infrastructures deployed, administered and managed by the community on a not-for-profit basis and seek to address the lack of ICT services in underserved areas. Paraguay's latest National Telecommunications Plan, in fact, states: "The deployment of community networks could be very effective and efficient as an alternative to bring connectivity to many communities in our country, especially in rural areas where there is not enough demand either in volume or purchasing power of potential users of telecommunications/ICT services".

But like info centres, community networks are much more than connectivity infrastructure: they are a rich community space for climate resilience because social management is fundamental to their functioning.[28] In this sense, community network development plans should also be seen as a pivotal space where digital connectivity meets the search for and production of climate resilience information for these rural communities.

- **Stimuli for the deployment of resilient information repositories in the absence of connectivity:**

In areas where internet connectivity is non-existent, unstable or expensive, there is also a need to deploy offline solutions that allow rural communities to access critical climate information to strengthen their resilience, such as pest information, low-cost applied technologies for drought irrigation, and so on. International private and community initiatives can help this effort, such as Wikifundi (from Wikimedia)[29] or Appropedia (the sustainability wiki).[30]

---

[27] Global Voices. 2022. La conectividad para reducir los impactos del cambio climático en el Gran Chaco, Sudamérica https://es.globalvoices.org/2022/07/13/la-conectividad-para-reducir-los-impactos-del-cambio-climatico-en-el-gran-chaco-sudamerica/

[28] Colnodo: ¿Qué son las redes inalámbricas comunitarias? 2023. Asociación para el Progredo de las Comunicaciones. https://www.apc.org/es/blog/colnodo-que-son-las-redes-inalambricas-comunitarias

[29] Offline WikiFundi closes the digital divide. 2022. Diff. https://diff.wikimedia.org/2022/02/26/offline-wikifundi-closes-the-digital-divide/

[30] Can the poor access Appropedia? 2022. Appropedia. https://www.appropedia.org/Appropedia:Can_the_poor_access_Appropedia%3F

- **Advocate for an international solidarity fund for infrastructure and connectivity for climate mitigation:**

However, the creation of infrastructure and the affordability of broadband, including electronic devices, remains a priority for developing countries, especially those with rural areas that need to catch up in connectivity. However, public and private investments are an uphill struggle for landlocked developing countries (LLDCs), such as Paraguay. The question is why, if the twin transitions are proposed as a climate mitigation policy for developed countries, they do not consider funds to help countries that lag in connectivity.

Following the logic and experience of the loss and damage compensation funds that drive the UN climate mechanisms (special funds from rich countries that seek to compensate for the negative consequences of climate change in the most affected countries that did not contribute to the crisis), in times of climate urgency, where the pressure for twin transitions may leave developing countries further behind, it is proposed that the creation of an international fund for the connectivity of SLDCs for their climate resilience.

In other words, if mitigation of the climate crisis is to be based on the digital transition, it must be a priority to reach the communities that suffer most, the rural communities of the Global South, through sustainable technologies that are resilient to the new climate conditions, that respond to the diverse needs and autonomy of these communities, that respect their human and environmental rights, and that are also a fundamental key to supporting them in their climate adaptation.

These funds must come from the countries that have caused the climate crisis the most and must have transparent and democratic governance that effectively responds to the urgent connectivity needs of rural communities in pursuit of climate adaptation.

***