

GLOBAL INFORMATION SOCIETY WATCH 2020

*Technology, the environment and
a sustainable world: Responses from
the global South*



ASSOCIATION FOR PROGRESSIVE COMMUNICATIONS (APC)
AND SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY (SIDA)

Global Information Society Watch 2020

Technology, the environment and a sustainable world: Responses from the global South

Operational team

Valeria Betancourt (APC)

Alan Finlay (APC)

Maja Romano (APC)

Project coordination team

Valeria Betancourt (APC)

Cathy Chen (APC)

Flavia Fascendini (APC)

Alan Finlay (APC)

Leila Nachawati (APC)

Lori Nordstrom (APC)

Maja Romano (APC)

GISWatch 2020 advisory committee

Shawna Finnegan (APC)

Carlos Rey-Moreno (APC)

Jennifer Radloff (APC)

Chat García Ramilo (APC)

Leandro Navarro (Pangea, Universitat Politècnica de Catalunya - UPC)

Arun M. (SPACE Kerala)

Florencia Roveri (Nodo TAU)

Y. Z. Yaú (CITAD)

Joan Carling (Indigenous Peoples Rights International)

Project coordinator

Maja Romano (APC)

Editor

Alan Finlay (APC)

Assistant editor and proofreading

Lori Nordstrom (APC)

Publication production support

Cathy Chen (APC)

Graphic design

Monocromo

Cover illustration

Matías Bervejillo



APC would like to thank the Swedish International Development Cooperation Agency (Sida) for their support for Global Information Society Watch 2020.

Published by APC

2021

Creative Commons Attribution 4.0 International (CC BY 4.0)

<https://creativecommons.org/licenses/by/4.0/>

Some rights reserved.

Global Information Society Watch 2020 – web and e-book

ISBN 978-92-95113-40-4

APC-202104-CIPP-R-EN-DIGITAL-330

Disclaimer: The views expressed herein do not necessarily represent those of Sida, APC or its members.



Latin American School of Networks Foundation (EsLaRed)

Sandra L. Benítez U. (sandrabenitez6@gmail.com)

<https://www.eslared.net>

Introduction

Venezuela is one of the countries with the greatest genetic diversity on the planet,¹ because it is located in a tropical region² and because it has a significant volume of natural forests. However, human activity has reduced this diversity, among other reasons, due to the alteration of ecosystems, high consumption of fossil fuels, high CO₂ emissions, deforestation, and the execution of investment projects³ with high environmental costs (Arco Minero del Orinoco,⁴ etc.). In this context, Venezuela faces a climatic and environmental emergency that affects the sustainable development of the nation and threatens the natural heritage of Venezuelans.

This report evaluates how the use of digital technologies can mitigate climate change in the country. This includes those that allow the handling of large volumes of data, issue early warnings for environmental disasters, and determine the deterioration of the environment. It is also our intention to review those that meet the needs of citizens in the face of environmental problems that affect health and quality of life.

This report outlines the prevailing legal framework in the country, and plans, projects and treaties that promote the use of digital technologies to protect, conserve and restore the environment in the country. Furthermore, the risk posed by environmental deterioration in Venezuela and its effects on civil society are evaluated. Finally, a series of recommendations are presented on the use of digital technologies to achieve environmental sustainability and to mitigate climate change in the country.

Legal and structural framework

Venezuela has a broad legal framework that protects the rights of nature, the individual and collective right to a healthy, safe and ecologically balanced environment, the right to environmental education, and the defence of a sustainable world as indicated in articles 107, 127 and 128 of the Constitution of the Bolivarian Republic of Venezuela.⁵ Likewise, there are a series of laws aimed at addressing the vulnerability of the environment and adaptation to and mitigation of the effects of climate change, such as the following: Education Law,⁶ Organic Law of the Environment,⁷ Law of Forests,⁸ Water Law, Law of Coastal Zones,⁹ Law of Integral Management of Socio-natural and Technological Risks,¹⁰ Law of Biological Diversity,¹¹ Law of Aquatic Spaces,¹² Law of Rational and Efficient Use of Energy,¹³ and Criminal Law of the Environment.¹⁴ There are also specific decrees, such as: Standards on Air Quality and Control of Atmospheric Pollution,¹⁵ Standards for Classification and Quality Control of Water Bodies and Liquid Discharges or Effluents,¹⁶ and Standards on Environmental Assessment of Activities Susceptible to Degrade the Environment.¹⁷

The use and management of technology to achieve environmental development is part of

1 <https://vitalis.net/cambio-climatico-2/venezuela-ante-el-cambio-climatico>

2 6154eler/en-que-region-del-mundo-habita-la-mayor-parte-de-la-diversidad-biologica; <https://www.elpais.com.uy/vida-actual/elaboran-primer-mapa-global-diversidad-genetica-planeta.html>

3 http://www.scielo.org.ve/scielo.php?pid=S1315-64112009000100010&script=sci_arttext

4 <https://arcominerodelorinoco.com>

5 <http://www.conatel.gob.ve/constitucion-de-la-republica-bolivariana-de-venezuela-2>

6 <http://www.minci.gob.ve/wp-content/uploads/2018/08/Ley-Org%C3%A1nica-de-Educaci%C3%B3n.pdf>

7 http://www.mp.gob.ve/c/document_library/get_file?uuid=8e849b6f-807e-456b-aace-02f6da5782e1&groupId=10136

8 <http://monitorlegislativo.net/wp-content/uploads/2014/11/Ley-de-Bosques-2013.pdf>

9 <http://www.leyesvenezolanas.com/aguas.html>

10 https://www.ifrc.org/docs/IDRL/Venezuela-ley_G.I.R.S.T.pdf

11 https://www.acnur.org/fileadmin/Documentos/Pueblos_indigenas/ley_diversidad_biologica_ven.pdf?view=1

12 <http://www.inea.gob.ve/action/getblob?random=0.7842823373175434&id=19>

13 http://www.mppp.gob.ve/wp-content/uploads/2018/05/GO-39823_energia.pdf

14 <https://www.derechos.org.ve/pw/wp-content/uploads/Ley-Penal-del-Ambiente2.pdf>

15 <http://www.corpoelec.gob.ve/sites/default/files/decreto-638.pdf>

16 <https://www.lurconsultores.com/wp-content/uploads/2017/07/1995-Decreto-883.pdf>

17 <http://www.conatel.gob.ve/ley-organica-de-ciencia-tecnologia-e-innovacion-2/>

<p://extwprlegs1.fao.org/docs/pdf/ven17517.pdf>

extractive model with high environmental costs⁴⁵ and the use of highly polluting extractive techniques with a negative environmental impact.⁴⁶

Organisations such as the Agua Clara Foundation⁴⁷ argue that Venezuela does not comply with national laws and international conventions on environmental rights, as well as those of environmental organisations⁴⁸ that support the Declaration of Climate Emergency.⁴⁹ At the same time, the government's secrecy⁵⁰ regarding the management of environmental data and information makes it impossible to monitor and scientifically follow up on environmental damage, or to evaluate environmental indexes.

According to the Amazonian Network of Georeferenced Socio-Environmental Information,⁵¹ "the deforestation index in Venezuela increased between 2005 and 2015," making it "the only Amazonian country whose deforestation rate rose." It also points out that "in Venezuela, mining displaced the creation of pasture lands and crop fields as the main consequence of deforestation."

Our minister of foreign affairs points out that while "Venezuela encourages the mitigation of the climate catastrophe at COP25,"⁵² the country is also "a victim of the capitalist system." This makes it difficult for us to maintain the commitments of the Paris Agreement, because we suffer unilateral coercive measures from the United States.⁵³ However, projects such as those by "Siembra Petrolera"⁵⁴ were started in 2005, a time when the country had not been subject to these coercive measures from the US.

It should be mentioned that the alteration of ecosystems, a product of global warming,⁵⁵ high CO₂ emissions and deforestation have had an alarming impact on the disappearance of glaciers,⁵⁶ the death of the main coral reefs in the coastal areas,⁵⁷ and the rise in the sea level.⁵⁸ This affects the natural variability of the climate,⁵⁹ producing extreme and more intense events, such as copious rainfall, droughts and heat waves across the country. This reality increases forest fires⁶⁰ and floods,⁶¹ which result in a loss of human life and property damage. It also influences the quality of air and water in cities⁶² and the weakening of vector control programmes (for mosquitoes),⁶³ promoting the proliferation of infectious diseases (dengue and malaria) and respiratory diseases, significantly affecting the citizens of the country and the region.

Use of technologies in critical areas to mitigate climate change

Given the above, it is clear that Venezuela is facing a climate and environmental crisis⁶⁴ which affects the sustainable development of the nation, and which requires urgent measures that promote the implementation of gradual solutions in specific areas.

A series of technological solutions are presented below, which have been implemented in Venezuela:

- Technologies and management platforms for hydrometeorological forecasting: INAMEH uses

45 <https://historico.prodavinci.com/blogs/el-ecosocialismo-de-la-venezuela-petrolera-una-paradoja-por-jonathandias-diadelatierra>; http://www.scielo.org.ve/scielo.php?pid=S1315-64112009000100010&script=sci_arttext

46 <https://arcominerodelorinoco.com/>

47 <https://www.examenonvenezuela.com/examenes-de-tratados/venezuela-no-cumple-leyes-nacionales-y-convenios-internacionales-en-derechos-ambientales#:~:text=Venezuela%20no%20cumple%20leyes%20nacionales%20y%20convenios%20internacionales%20en%20derechos%20ambientales,-1%20junio%2C%202015>

48 <http://www.derechos.org/ve/pw/wp-content/uploads/DIRECTORIO-ONGS.pdf>

49 <https://drive.google.com/file/d/1G16fxT9w5PAh21tDaZldPuWd4oh4FvP/view>

50 <https://efectococuyo.com/la-humanidad/medioambiente-censura-informacion>

51 <https://www.amazoniasocioambiental.org/es>; <https://efectococuyo.com/la-humanidad/medioambiente-censura-informacion>

52 <https://unfccc.int/en/cop25>

53 <https://efectococuyo.com/opinion/la-cop-25-y-venezuela>

54 http://www.pdvsa.com/index.php?option=com_content&view=article&id=8010:plan-siembra-petrolera-cumplio-diez-anos&catid=10&Itemid=589&lang=es

55 <https://www.cinco8.com/perspectivas/como-pais-petrolero-tenemos-una-obligacion-en-mitigar-el-cambio-climatico>

56 <https://medium.com/@ElDiariodeCCS/venezuela-en-extincion-el-calentamiento-global-acaba-con-los-ecosistemas-del-pa%C3%ADs-ADS-d707bc865da6>; <https://www.ecopoliticavenezuela.org/2019/09/27/venezuela-sera-primer-pais-perder-todos-glaciares-la-region>; <https://www.france24.com/es/20191003-medio-ambiente-cientificos-venezolanos-glaciar>; <https://www.nationalgeographic.es/medio-ambiente/2018/11/el-ultimo-glaciar-de-venezuela-esta-punto-de-desaparecer>

57 <https://medium.com/@ElDiariodeCCS/venezuela-en-extincion-el-calentamiento-global-acaba-con-los-ecosistemas-del-pa%C3%ADs-ADS-d707bc865da6>

58 <https://www.ecopoliticavenezuela.org/2019/11/08/el-cambio-climatico-podria-borrar-ciudades-enteras-de-la-costa-del-lago-de-maracaibo-en-venezuela>

59 <https://marygerencia.com/2010/05/09/el-cambio-climatico-en-venezuela>

60 <https://www.diariolasamericas.com/americas-latina/incendios-forestales-venezuela-afectan-salud-respiratoria-n4197082>

61 <https://es.mongabay.com/2018/08/inundaciones-venezuela-rio-orinoco-amazonas-bolivar>

62 http://ve.scielo.org/scielo.php?script=sci_arttext&pid=S1316-71382015000200009

63 https://elpais.com/elpais/2019/04/16/planeta_futuro/1555402255_653709.html

64 <https://www.agendavenezuelaz2030.org/noticias/declaracion-de-emergencia-climatica-de-la-sociedad-civil-de-venezuela>; <https://www.agendavenezuelaz2030.org/noticias/declaracion-de-emergencia-climatica-de-la-sociedad-civil-de-venezuela>

a web platform⁶⁵ that captures data and information from space detectors managed by the National Institute of Space Research of Brazil (INPE). In real and delayed time they transmit the data efficiently, continuously and automatically through images that map the behaviour of tropical waves, waves, cyclones and tropical disturbances in general. This platform generates newsletters that present monthly climate information,⁶⁶ monitors drought,⁶⁷ presents early risk warnings of fires,⁶⁸ and forecasts river flows,⁶⁹ among others.

- Technologies for monitoring forest fires: The monitoring and analysis of data of forest fires in Venezuela is carried out through space fire detectors. NGOs use the satellite instruments of the US Space Agency – MODIS⁷⁰ and VIIRS⁷¹ – which allow the information from the satellites to be transformed into active fire maps. Prodavinci,⁷² in April 2020, analysed 20 years of fire data registered by the satellites,⁷³ identifying global trends and incidents attributed to climate change. For its part, INAMEH detects sources of heat through the data and information that INPE captures, using the AQUA satellite with a MODIS sensor. Later it makes an adjustment of the necessary parameters in its database to be able to generate information for the territory. The institute generates early fire risk bulletins⁷⁴ (for the review date, the data corresponded to the month of February 2020) and fire maps.⁷⁵
- Technologies to measure air pollution in Venezuela: The Ministry of the Environment, through the General Directorate of Environmental

Quality, with the support of specialised and authorised private laboratories, measures air quality in situ with the use of two pieces of equipment called Partisol⁷⁶ and Hivol.⁷⁷ The Directorate is in charge of supervising, interpreting and corroborating the data provided by the laboratories regarding emissions into the atmosphere and their legal validity, and subsequently assesses potential actions. A real-time map of air pollution in Venezuela is created,⁷⁸ which uses GAIA⁷⁹ air quality monitoring stations with high-tech particle laser sensors to measure the PM2.5 pollution, which is one of the most harmful pollutants.

- Climatic stations: In Venezuela there are official organisations such as INAMEH that manage climatic stations, as well as high mountain climatic networks, such as the Gloria Network⁸⁰ (Initiative for Research and Global Monitoring of Alpine Environments). The Gloria Network is responsible for regionally monitoring the impact of climate change on the biodiversity of the high Andes. Currently it is a system of 14 stations in that geographical area. This system generates information for the development of mitigation and adaptation actions to reduce the vulnerability of ecosystems. The Institute of Environmental and Ecological Sciences of the University of Los Andes is responsible for monitoring the station located in the Culata wasteland (páramo de la Culata). INAMEH has 20 hydrometric stations and 30 rainfall stations throughout the territory to strengthen responses in risk management and early warnings, as well as to strengthen the National Surface Observation System. The hydrometeorological stations are linked to the Geostationary Operational Environment Satellite (GOES).⁸¹

- Technologies to detect vegetation cover in Venezuelan territory: Digital maps generated with the MapBiomás Amazonía Platform⁸² are used. This uses cloud processing and automated classifiers developed and operated from the Google Earth Engine platform. In particular, NGOs such as

65 <http://www.inameh.gob.ve/web/#!>

66 <http://www.inameh.gob.ve/web/PDF/Boletin%20Climatico%20junio%202020.pdf>

67 http://www.inameh.gob.ve/web/PDF/MONITOREO_DE_SEQUIA.pdf

68 <http://www.inameh.gob.ve/web/PDF/Boletin%20de%20Alerta%20Temprana%20al%20Riesgo%20de%20Incendios%20Forestales%20para%20los%20días%2019,%2020y%2021%20de%20febrero%20de%202020.pdf>

69 <http://www.inameh.gob.ve/web/PDF/Pronostico%20de%20Niveles%20en%20Ciudad%20Bolívar%20del%20Río%20Orinoco.pdf>

70 <https://modis.gsfc.nasa.gov/about>

71 https://en.wikipedia.org/wiki/Visible_Infrared_Imaging_Radiometer_Suite

72 <https://prodavinci.com>

73 <http://factor.prodavinci.com/que-nos-dicen-los-satelites-sobre-los-incendios-en-caracas-y-miranda/index.html>

74 <http://www.inameh.gob.ve/web/PDF/Boletin%20de%20Alerta%20Temprana%20al%20Riesgo%20de%20Incendios%20Forestales%20para%20los%20días%2019,%2020y%2021%20de%20febrero%20de%202020.pdf>

75 <http://www.inameh.gob.ve/web/imagenes/mapas%20de%20incendios/mapas.php>

76 <http://www.ayt.cl/catalogo-de-productos/monitores-de-material-particulado/discretos/pm-10/muestreador-mp10-y-mp2-5-secuencial-de-aire-thermo-scientific-partisol-2025j>

77 <https://www.directindustry.es/prod/ecotech/product-50178-1300969.html>

78 <https://aqicn.org/map/venezuela/es/m>

79 <https://aqicn.org/gaia/es>

80 <https://redgloria.condesan.org>

81 https://es.wikipedia.org/wiki/Geostationary_Operational_Environmental_Satellite

82 <https://amazonia.mapbiomas.org>

Wataniba and Provita⁸³ – member organisations of the Amazonian Network for Georeferenced Socio-Environmental Information⁸⁴ – and the SOS Orinoco initiative processed satellite images in 2019 and produced digital maps that reflect the situation of vegetation cover in Venezuelan territory.⁸⁵ When evaluating information held by official entities on this issue, a recurrent absence of official information from the last five years was evidenced.

- Technologies for risk management and early warnings: INAMEH's network of automatic hydrometeorological stations⁸⁶ make it possible to strengthen responses in risk management and early warnings. The installed equipment allows the measurement, collection, processing and transmission of information to the INAMEH digital processing and storage centre under sub-systems by stations capturing hydrological data (radars to measure flow and pressure, which are submerged in the river to measure depth) and reservoir, climatological and rainfall data. In addition, INAMEH manages the pilot plan of an early warning system which seeks to empower communities through hydrometeorological knowledge, as a way to monitor the situation, coordinate efforts and prevent natural disasters.
- Environmental care platforms: The National Assembly promotes the use of the National Platform for Climate Action,⁸⁷ which allows the fight in defence and safeguarding of the country's natural resources to be channelled. On the other hand, the Impact Hub Caracas entrepreneurship network⁸⁸ supports the development of applications such as CitySens, which is a tool where citizens can report irregular situations, suggest advice or information to other users, request the provision of a service and report faults or incidents in the different communities of the country, either through the corresponding application or by SMS. Additionally, it allows alliances with the mayor's office, with an option in which citizens can propose new projects

suitable for the community to be voted on by their neighbours.

- Technologies that support environmental sustainability initiatives: Arbol Portatil⁸⁹ is an atmospheric transformation project. The prototype captures a sample of carbon dioxide, processes it and removes impurities. It can filter and clean up to 30 litres of air in five minutes, exceeding the process of capturing CO₂ from small or growing trees. During 2019 the projects were presented to the National Assembly for future implementation.

Conclusions

Once the environmental difficulties have been identified, as well as the strengths that exist in the country related to the use of technologies and the management of a legal framework aimed at addressing the conditions of vulnerability of the environment, it can be seen that Venezuela is going through a complex crisis at different levels of society, which directly affects climate change.

In particular, political divergences in the implementation of an environmental development model are damaging the natural heritage of Venezuelans. This is also affecting the survival of Indigenous communities, and promoting the proliferation of diseases that have already been eradicated, putting the inhabitants of the country and the region at risk.

In addition, the lack of transparency of the government in relation to the management of data and information on environmental indicators makes it impossible to carry out scientific analysis of the country's environmental situation and timely monitoring of the natural changes of the climate. This results in the loss of human life and fauna. This crisis also leads to a search for information by environmental organisations through private entities and support networks in the region. This creates overlapping efforts but facilitates an alternative assessment of the environmental reality.

It cannot be ignored that the government has made an effort to maintain risk management and early warning systems using weather stations. However, this report shows that of the 335 stations⁹⁰ that had to be installed, according to INANEH, only 50 are functional. This is evidence of the difficulties faced by entities such as INAMEH, and creates a critical problem for communities who have to face a number of natural disasters such as floods.

83 www.provitaonline.org

84 <https://watanibasocioambiental.org/raisg-lanza-mapbiomas-amazonia>

85 <https://www.derechos.org/ve/web/wp-content/uploads/2020/07/05AmbienteSano.pdf>

86 <http://www.inameh.gob.ve/web/prensa/noticias.php?n=1965>

87 <https://8oonoticias.com/parlamento-instalo-plataforma-nacional-de-accion-por-el-cambio-climatico>; <https://www.lavanguardia.com/politica/20191106/471433275257/venezuela-crea-su-mayor-plataforma-de-accion-contra-la-crisis-climatica.html>

88 <https://caracas.impacthub.net/apps-de-prestacion-de-servicios-publicos-y-reciclaje-representaran-a-venezuela-en-las-semifinales-regionales-de-technovation>

89 <https://www.youtube.com/watch?v=nHLQACMqWbo>, <https://www.youtube.com/watch?v=K4bCvcBlJ4>

90 <http://www.inameh.gob.ve/web/prensa/noticias.php?n=1965>

On the other hand, it is important to note that the government maintains alliances with international institutions and laboratories to use technologies that allow the collection of data and information related to air pollution and forest fires. Likewise, NGOs and civil society rely on research centres, universities, regional networks and international alliances to collect and analyse data, develop digital maps, and prepare alternative reports that warn of the critical environmental situation in the country.

As a summary, in Venezuela efforts have been made to use technologies to map the different environmental indicators. However, these have been managed in a non-transparent way by the government, preventing an objective assessment of climate change in the country by NGOs, research centres, etc. This report also shows that government entities, NGOs and companies use technological platforms, information systems, applications and innovation projects aimed at mitigating climate change. However, the political, economic and social situation affects the implementation of adequate environmental policies, which significantly affects climate change in Venezuela – a situation that transcends the will to mitigate it through technologies.

Action steps

The following action steps can be suggested for Venezuela:

- The government is in charge of monitoring the behaviour of environmental indicators. Because of this they must manage data and information in a transparent and timely manner, and make the data and information available where different organisations can access them, through web platforms or institutional repositories.
- A national consensus is required from all the country's forces (government and opposition)

to evaluate the applicability of the ecosocialist model in terms of the international agreements established with countries on the exploitation of mining, gas and oil areas. This is necessary given the extent of the environmental destruction generated by some of the projects that are underway, which puts the country's natural heritage at risk and drastically affects climate change.

- A change of attitude should be promoted among the people of the country regarding the country's environmental problems. For this it is necessary to strengthen individual and collective awareness about the environmental crisis. In addition, the use of technologies, tools and applications should be promoted to keep communities, companies and NGOs vigilant and alert about environmental aspects that harm climate change.
- Endeavours that facilitate the development of platforms, systems, tools and applications that allow the mitigation of climate change in the country should be supported.
- The entities responsible for the environment must strengthen and speed up strategic projects, such as the installation of weather stations, to consolidate an adequate early warning system and avoid environmental catastrophes.
- Multisectoral groups involved in the environment must evaluate the current state of digital technologies used to manage climate change in the country, and determine potential improvements that allow the integration, accessibility and availability of platforms. They should also consider successful experiences with digital technologies in developed countries and in other Latin American and Caribbean countries, in order to make them a reality in Venezuela.

Technology, the environment and a sustainable world: Responses from the global South

The world is facing an unprecedented climate and environmental emergency. Scientists have identified human activity as primarily responsible for the climate crisis, which together with rampant environmental pollution, and the unbridled activities of the extractive and agricultural industries, pose a direct threat to the sustainability of life on this planet.

This edition of Global Information Society Watch (GISWatch) seeks to understand the constructive role that technology can play in confronting the crises. It disrupts the normative understanding of technology being an easy panacea to the planet's environmental challenges and suggests that a nuanced and contextual use of technology is necessary for real sustainability to be achieved. A series of thematic reports frame different aspects of the relationship between digital technology and environmental sustainability from a human rights and social justice perspective, while 46 country and regional reports explore the diverse frontiers where technology meets the needs of both the environment and communities, and where technology itself becomes a challenge to a sustainable future.

GLOBAL INFORMATION SOCIETY WATCH

2020 Report

www.GISWatch.org

