

Network for Cooperation in Integrated Water Resource Management for Sustainable Development in Latin America and the Caribbean



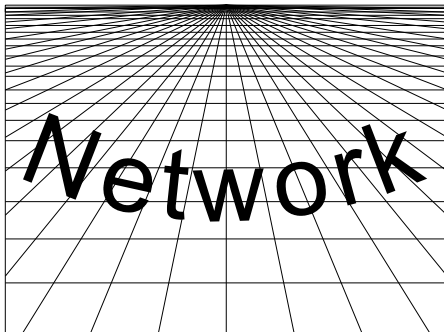
United Nations Economic Commission for Latin America and the Caribbean (ECLAC)

N° 51

February 2020

CIRCULAR N° 51

The bioeconomy can be understood as the production, use and conservation of biological resources, including science, technology, innovation and related knowledge, to provide information, products, processes and services across all economic sectors with a view to creating a sustainable economy. This widely accepted definition derives from the leveraging of the potential offered, first, by the rapid development of knowledge in biological sciences, and second, by the use of biological resources as an alternative to fossil fuels to drive economic development.



The emergence of the bioeconomy as a development approach has been fostered by concerns about the ongoing process of climate change. Scientists generally agree that this phenomenon is human-made and that greenhouse gas emissions generated by fossil fuel use are one of the main causes. Fighting climate change therefore implies adjustment of the material and energy basis of the economy. Given that biological resources are the material and energy foundation of the bioeconomy, the latter is central to the new model needed to combat climate change.

The bioeconomy is also emerging amid the backdrop of concern about the sustainability of agriculture in terms of the use of natural resources (especially land and water), environmental impacts and greenhouse gas emissions from production activities and land-use change for expansion. The bioeconomy offers solutions to these concerns, contributing to both climate change adaptation and mitigation and strengthening synergies between the two. For example, it can reduce

greenhouse gas emissions through the development of new biological inputs and the production of bioenergy, while modern biotechnologies can be used to create crop varieties better suited to conditions of water stress, heat and salinity, increasing agricultural resilience. It also makes it possible to use crops and other biological entities as biofactories so that inputs and products currently made by traditional processes can be produced more efficiently.

The bioeconomy concept as a development approach has been favoured by advances in science and technology and the need to address new problems and concerns. In particular, its emergence has been helped by the extraordinary progress in knowledge and the development of technologies associated with the biological sciences in the past three decades. It has also been driven by the complementarity and convergence between these and materials science and technology (especially nanotechnology) and information (for example, digitization, communication and the Internet of things).

There are similarities and differences between the bioeconomy and the concepts of the circular and green economies, which are also currently being discussed as approaches to more sustainable development. For instance, they are all multidimensional approaches that aim at lower greenhouse gas emissions, greater energy and water efficiency, efficiency in material and resource use, responsible consumption and a large role for innovation.

The United Nations Environment Programme (UNEP) has described the green economy as “one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities”, underscoring that “a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive”. Meanwhile, the circular economy (and related concepts such as industrial ecology, ecosystems and symbiosis) seeks more limited and efficient use of resources, reuse and recycling of industrial products and extension of their useful life.

The distinctive feature of the bioeconomy is that its material and energy foundation are biological resources and its scientific and technological base are the biological sciences. The green economy and circular economy concepts do not distinguish by the nature of resources, as bioeconomics does by definition. Bioeconomics is therefore a new technical and economic paradigm of production and consumption, an alternative to the fossil fuel model that was consolidated during the twentieth century. The bioeconomy does not rely on using fossil resources more efficiently but on replacing them as the source of energy processes, and it is circular by nature.

CONTENTS

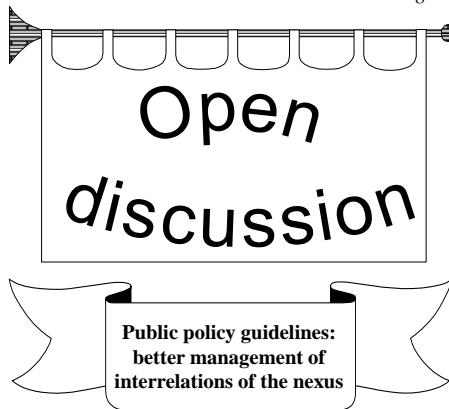
- **Editorial remarks:** The bioeconomy as a new technical and economic paradigm.
- **Open discussion:**
 - Public policy guidelines: better management of nexus interrelations.
 - Water, food production and energy: the nexus experience in Chile.
 - Water management from the perspective of the nexus in Peru.
- **Meetings:**
 - Latin American Sanitation Conference.
- **News of the Network:**
 - Economic Infrastructure Investment Data in Latin America and the Caribbean database.
 - Interjurisdictional Environmental Health Board in Argentina.
 - Strategic Council for the Utilization of Puerto Busch in the Plurinational State of Bolivia.
 - National Urban Development Policy 2018-2030 in Costa Rica.
 - Implementation of Water Sowing and Harvesting in Peru.
 - Directive Promoting Measurement and Reduction of the Water Footprint in Peru.
- **Internet and WWW News.**
- **Recent ECLAC publications** on water management and water supply and sanitation.

It is also important to stress that having biological resources as a material and energy base does not guarantee that the bioeconomy will be sustainable and inclusive, two explicit objectives of the green economy. To this end, it is essential for biological resources to be used within the natural limits that ensure their

reproduction, and as far as possible in a way that benefits the whole of society.

Biological resources include: biomass grown for food, feed, fibre and energy; biomass from marine resources and that produced by aquaculture; forest biomass, especially that grown for use in the forestry and related industries; waste biomass in agriculture, fisheries and aquaculture, forestry and agro-industry; biomass that can be recovered from urban sewage and waste products from livestock and human activity; and terrestrial and marine biodiversity (biochemical elements, genes, proteins and microorganisms of interest for research and commercial applications).

Adrián Rodríguez



We shall continue with the presentation of the action plan put forward in the study “*Lineamientos de políticas públicas: Un mejor manejo de las interrelaciones del Nexo entre el agua, la energía y la alimentación*” (Public policy guidelines: Better management of interrelations of the water, energy and food nexus) by Antonio Embid and Liber Martín (see Circular No. 50). The earlier discussion focused on the basic elements of the plan and its first stage, which was to appraise the situation. In this issue we shall present the rest of the stages.

Improving knowledge

In cases where information is found to be lacking or of poor quality, or available only for the wrong time or place, action must be taken as needed to rectify these shortcomings. These actions could be as follows:

- Creation and improvement of registers and records of water use rights and wastewater disposal permits.
- Efforts to incorporate informal uses into registers by means of: legal incentives for this; technical assistance provided by the competent administrations to informal users to facilitate regularization; and detailed and exact specification of substantive legal consequences for users who hold out against the obligation to record their usage in the registers even with such assistance.

- The plans and instruments adopted at this stage should not be limited to one sector, but should provide that both the content (data) and the format in which it is stored allow for sharing and cross-referencing with other areas (for example, databases on water uses and electricity consumption).
- If deemed appropriate, creation of a public entity (along the lines of an institute of statistics) with the capacity to collect information, and a consequent obligation for specified public and private actors to provide this entity with data on the activity they carry out. This option will usually require a law to legitimize both the creation of the organization and the obligation (and incentives) for individuals and the various public agencies to provide it with information at its request or on their own initiative when particular circumstances arise.
- Technical training for public officials or employees entrusted with the tasks specified here, something that is considered essential to promote the success of policies relating to information and the regularization of informal uses.

The actions listed above may overlap with some from the first stage or with each other, as they involve different types of actions. What is specified here is essential for sound decision-making in the different sectoral areas of the nexus.

The regulatory framework and administrative organization

In specific cases, it is highly possible that the lack of public policies to enhance the relationship between the different components of the nexus will be justified by those responsible on the grounds that the regulations make no provision for them or even make them impossible by taking a fragmented approach to activities. It will probably be said that these regulations have been created sector by sector without any connection between them, and that they do not include measures to interrelate or coordinate the different sectors. In all likelihood, they will not provide for administrative bodies to coordinate or encourage coordination between the public bodies responsible for the different sectoral policies. The right actions to carry out at this stage would be the following:

- Existence of a law regulating public activities and the framework within which private actions are to be carried out in each component of the nexus.
- With special emphasis on the existence of a water law (because water is the core component of the nexus), each country should have a law with modern characteristics. The mere existence of a law or regulations on drinking water and sanitation services is not enough for this guideline to be considered met.

- In particular, the legislation should contain specific prescriptions for appropriate planning in the three sectors of the nexus, as this is the essential tool for implementing nexus policies.
- The legislation should also provide for the existence of agencies to coordinate the sectoral public policies conducted by other bodies within the government administrative apparatus (those competent at sectoral level), and should be of high enough administrative status to ensure that their actions are accepted without express or implicit resistance.
- In the event that such coordinating bodies exist, it is desirable for their designations or the extent to which their orders or instructions are binding at the ministerial or similar level to be appropriate to the administrative tradition and organizational capabilities of the country, since it is the objective to be fulfilled by such bodies that matters. In any event, they must be given sufficient powers to enable them to properly carry out the coordination work entrusted to them.

Implementing and improving planning

Precepts relating to planning, which must be included in the regulations mentioned in the third stage, need to be implemented effectively and not be mere theoretical possibilities conferred by the legislator on the public administration. For this reason, decisions must be taken at a high level of government so that the planning procedures provided for can begin or, where appropriate, so that existing planning can be reviewed if it is temporarily exhausted (a situation that will arise when the deadlines provided for in the regulations for reviewing the plan have elapsed) or does not meet the requirements of the new regulations that have appeared to meet nexus policy requirements.

If planning has already been approved, the results of its implementation must be examined (if it has been implemented), as must the question of whether the results achieved show implementation to meet the requirements of the interrelationship between the components of the nexus and the joint assessment of the sectoral policies undertaken on the basis of that planning. If the results are unsatisfactory because of shortcomings in existing regulations or in the procedure for regulating the preparation of administrative plans, measures must be taken to improve the functioning of the system.

Implementing and improving economic incentives

The first recommendation is the introduction of at least two economic instruments: a payment (charge, rate, tax, etc.) for the extraction of water from water bodies,

according to the different uses it is put to (urban, agricultural, hydropower or refrigeration, or in the production of other forms of energy, etc.); and another for the discharge into water bodies of urban wastewater or that from industrial activities. In the case of wastewater from agricultural or livestock activities, this payment would be due when the components of the discharge exceed the quality parameters specified in the regulations. In both cases, it is recommended that payment be set at a level that roughly covers the costs to the public authorities of supplying (or purifying and cleansing) the water, alongside subsidies or compensation as needed to ensure that no-one in need is deprived of a basic supply, especially when this supply relates to the human rights associated with the different components of the nexus. These charges should be independent of any that may exist at the municipal level (regional or state, depending on the entity in charge of providing urban water-related services) to sustain public water supply and wastewater treatment services.

Regarding charges for water and electricity use in the agricultural sector, the emphasis should be on evaluating their impact, taking any priority interconnections into account. This means that charges, even if subsidized, must send signals about the scarcity of the resource and be set at a level that discourages (or penalizes) excessive consumption leading to significant reductions in the quantity and quality of water resources, even if this serves to increase agricultural production, and therefore threatens future production and the maintenance of aquatic ecosystems.

Properly coordinated economic and fiscal instruments are also well suited to promoting the production and consumption of renewable energy and the development of more efficient and sustainable agriculture.

River basin agencies

When it comes to creating or improving levels of organization for coordination and management, properly organized river basin agencies are essential not only for an appropriate water management policy but for nexus policy itself, since activities related to agricultural and energy policies can also be undertaken within these entities.

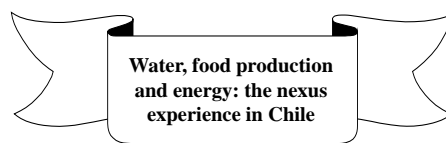
The difficulty of setting up river basin organizations makes it advisable to postpone full implementation until the final stages of the action plan. This does not mean neglecting the ultimate objective, which will have to be duly prepared for during the previous stages, especially by training users and the staff who will work in these organizations.

Where river basin organizations already exist, the task will be to bring their characteristics into line with the general

conditions recommended so that they have the effective capacity to manage water resources in their territorial area within a framework of participation by the different users and other stakeholders. They can also be expected to carry out activities in the fields of agriculture and energy, which are naturally related to this management. This presupposes a clearly established relationship with the rest of the public apparatus responsible for this area.

Investments oriented towards nexus policies

There is a gap between public and private investment in the countries of Latin America and the Caribbean. Institutional conditions (especially those relating to the existence of legislation that provides the basis for effective planning) are what will determine whether the complex decisions on public and private investment entailed by the requirements of the nexus are taken. In particular, the value of multi-purpose regulatory infrastructure as the best example of nexus policies is reaffirmed in the area of water policy; these are often traditional actions, but they must now be viewed from the specific nexus perspective.



According to the study “*Agua, producción de alimentos y energía: la experiencia del Nexo en Chile*” (*Water, food production and energy: the nexus experience in Chile*) by Humberto Peña (see Circular No. 50), what comes out of the analysis of the evolution of the nexus between water, irrigation and electricity in Chile over time is that the most important dimension of the nexus is the key contribution made by water resources to the country’s socioeconomic development since the nineteenth century through irrigated agriculture and hydroelectricity.

The specific form of interrelationship between the three elements of the nexus is essentially variable over time; it depends on a set of contextual factors of a geographical, economic, social, political and technological nature. There are periods in which the separate components of the nexus develop independently, interacting little and uninfluenced by one another; at other times, the actors perceive one another as competitors, with strong conflict between them; and, lastly, there are times when favourable synergies and convergences can be observed between them.

A very important factor is the relationship between the natural availability of water and the scale of agricultural and hydropower generation demands. Initially, in Chile, irrigation and energy needs were small compared to the water resources available.

This made it easy at first to reconcile the two requirements, but the situation gradually changed to one of strong competition.

In general, irrigation and hydropower generation demands grew with the country’s population and economy. An economic strategy based on opening up to international trade encouraged the export of a range of goods whose production depends critically on water and energy supplies, such as cellulose, minerals and fruit. Taking this into account, it could be said that the nexus between water, electricity and irrigation would have had different characteristics if the country had developed with a different production mix.

In a first stage, the nexus centred on the relationship between irrigation, hydroelectricity and the management of water resources. In this situation, the key instrument for determining this relationship was water legislation and its interaction with other sectoral regulations. In the last decade, this nexus has become more complex because of the following factors:

- The importance of water management and use is no longer due solely to their impact on energy production, as both are now major consumers as well. This new dimension stems from the role that energy now plays in water use (for example, because of the growth in energy consumption for pumping and desalination) and the improved economic productivity associated with this use (for example, through the application of mechanized irrigation technologies).
- The cost of energy directly affects the economic viability of production activities related to water use.
- Improving water use efficiency, energy efficiency and environmental protection are now interrelated issues. For example, efficient water use can have implications for the quality of the final product and its competitiveness in the market, cut energy and production costs and reduce the impact on the environment, all at the same time.

In the current situation, the nexus has ceased to be a matter for decision-making only at the national and river basin levels, for example when it comes to choosing the most appropriate energy mix for the country or allocating water resources to different uses. Moreover, at the microeconomic level, for example, the situation of the nexus is manifested at the scale of individual producers when they must decide whether to use technologies that increase water efficiency and agricultural productivity on their land at the expense of greater energy consumption, or when they decide to become self-producers. Therefore, one dimension of policies on these issues must concern the incentives, regulations and conditions that affect the decisions of individual users.

Public policies directly affect the way the interrelations between water, irrigation and energy are presented and regulated. For this reason, the political and ideological visions that have prevailed and the responses found to the challenges the country has had to face in its history provide a framework for characterizing the evolution of the nexus. The most important feature of these changes is the role assigned to the State and markets, since there are periods when the development of energy and irrigation lies with the State, in contrast to periods of absolute predominance of private enterprise and markets in a context of light regulation, finally leading on to the current period, in which the role of the State is mainly to set the direction for a national policy in which the private sector participates in a context of better-regulated markets.

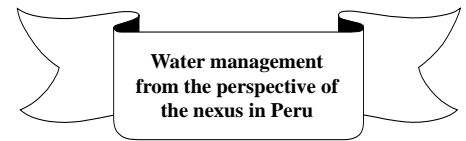
In recent decades, technological progress has played an increasing role in determining the characteristics of the nexus. Indeed, the large-scale incorporation of mechanized irrigation and the growing sophistication of water management in crop production, with a large impact on agricultural productivity, have created a relationship at the producer level between water, irrigation and energy that did not exist before. Much the same is true of the spread of electricity generation systems based on solar, wind or microhydroelectric power, which make it possible to produce energy for self-consumption and potentially feed it into distribution grids. Again, innovations related to energy storage in devices may profoundly alter the role of hydraulic energy in the future as an option for regulating the supply of electricity from intermittent sources.

Extending the benefits associated with the provision of domestic drinking water and sanitation services and electricity to the entire population has been among the objectives of public policy for more than 50 years. These objectives are now part of the broader framework of the Sustainable Development Goals (SDGs). Here it is worth highlighting the use of subsidies targeted at the most vulnerable population as instruments dealing in an integrated fashion with shortfalls in drinking water and sanitation services and energy in urban areas. With respect to the supply of drinking water and electricity in rural areas, the implementation of State programmes over decades has brought coverage of close to 100% in concentrated and semi-concentrated populations. In this sphere, consistent policies over time and general economic development have made it possible to achieve high standards of coverage. Lastly, with regard to the SDG of promoting the use of renewable and non-conventional energy sources, the progress made in the country has been remarkable and is an example to others.

Lastly, the following can be noted in relation to the future challenges of the nexus:

- In Chile's situation, the institutional model should be characterized by a strong role for the State, aimed at providing a strategic vision of the nexus and of the development of each of the sectors in a way that takes account of the demands of social equity, including attainment of the SDGs, economic efficiency and environmental sustainability. The institutional framework must provide appropriate participation arrangements and ample scope for the development of private enterprise within the framework of regulations that adequately safeguard the common good.
- It is essential to develop an institutional framework for the integrated management of water resources at the river basin level. In relation to the nexus, this institutional system, with the participation of stakeholders, should generate a strategic plan for the river basin that enables new hydroelectric generation and irrigation initiatives to be introduced harmoniously and infrastructure operation to be adapted to an energy mix with a greater presence of non-conventional renewable energies. Likewise, the institutional framework for the river basin should regulate the multiple externalities associated with irrigation and hydropower generation activities and respond to the threat posed to river basin management by climate change.
- In the current situation of the nexus, characterized by its growing complexity and the existence of interrelationships at different levels, a progressive effort of coordination between numerous sectors will be required to formulate a strategic vision on the basis of which policies and plans can be implemented. To this end, there is a need to create mechanisms at the agency level to fulfil this function in the public institutional system. A good example of this is the growing interaction observed in Chile between the Ministry of Energy and the Ministry of Agriculture, represented by the National Irrigation Commission (CNR), which has led to the implementation of programmes to promote non-conventional renewable energies on the part of farmers.
- The role of hydropower generation in the future energy mix is currently an open question. Hydroelectric plants could play a significant role as components that endow the system with robustness and security and can be supplemented with intermittent energy sources. However, this role could alter if technological changes reduce the costs of storing energy in devices, resulting in a competitive solution.
- The way the nexus has evolved in Chile, individual producers and public policies aimed at the efficient combined use of water and energy resources have become

increasingly important. Programmes with this orientation, aimed at supporting users in the area of irrigation and rural drinking water supply, should be maintained and strengthened.



The study "*La gestión del agua desde el punto de vista del Nexo entre el agua, la energía y la alimentación en el Perú: estudio de caso del valle de Ica*" (*Water management from the perspective of the water, energy and food nexus in Peru: Case study from the Ica Valley*) by Eduardo Zegarra (see Circular No. 49) sets out from the nexus between water, energy and food to analyse the different interactions between water users and public and private socioeconomic actors in the Ica Valley. The nexus approach provides an integrative conceptual framework permitting the evaluation of interactions between different components related to water, energy and food that are useful for diagnosing problems and designing and implementing public policy options in a specific territory such as this valley.

Export development in the Ica Valley has been underpinned by increasing exploitation of groundwater, dominated by a few large companies using modern irrigation techniques and equipment. Extracting water from the aquifer in this way is unsustainable, as it is being overexploited at a rate far in excess of natural replenishment.

The agroexporting process, in turn, has brought with it a considerable increase in the demand for energy to operate pumping systems and food processing plants. Other key players are also located in this territory, such as the population of the region's capital city, which has about 300,000 inhabitants and is growing rapidly, with the need to expand drinking water and sewerage systems that face serious problems of quality and coverage. The territory is exposed to the effects of climate change, with high areas of the river basin losing glaciers at an alarming rate and the availability of water for the valley decreasing.

From a nexus approach, the first and main problem in the Ica Valley is the weakness of the water authority, which, despite having a new regulatory framework, has not sufficiently strengthened its capacity to design and implement public regulation, oversight, coordination and planning policies with wide-ranging objectives of sustainability, equity and efficiency. In this context, the new water institutions present both limitations and opportunities that provide a basis for some recommendations:

- The first recommendation concerns the institutional structure for water

management. One of the key problems with the new water law has become evident: the fact that the national water authority has retained responsibility for one of the production sectors that uses the resource, namely agriculture. A similar problem concerns users' organizations, which are perceived as having a strong bias against non-agricultural uses. In the case of the Ica Valley, this structure has made it much more difficult for the authority to deal with the problem of overexploitation of the aquifer. In this regard, it would be advisable to consider a regulatory change whereby the water authority was no longer attached to a specific sector but became an autonomous authority with constitutional rank, like the Central Reserve Bank. This authority should have its own separate organization of administrative departments with functional responsibilities for specific water uses (such as irrigation, hydropower and drinking water and sanitation services) and for specific economic activities or promoting of water uses.

- A second recommendation for the specific case of the Ica Valley is to make more effective and efficient use of schemes of financial compensation for water use. The authorities can design specific compensation schemes for the Ica river basin that will lead to changes in the opportunistic behaviour of companies that are overexploiting an aquifer of enormous economic and ecological importance. This, in turn, would generate additional budgetary resources to strengthen the local water authorities and the River Basin Water Resources Councils (CRHC) for long-term planning and investment.
- It is also advisable to strengthen the use of joint water management schemes between the regions of Ica and Huancavelica, respecting the principles of full participation and a voice for all stakeholders, with the State balancing out the great inequalities in power between different social and economic groups. "Green" technical solutions to the issue of water scarcity that can be socially and environmentally preferable to the construction of more "grey" infrastructure also emerge in these processes. It should be said that this progress may be threatened by changes in local and regional authorities, for which reason the authorities are advised to expand measures to raise awareness in civil society of the importance of maintaining and strengthening agreements of this type between the two regions.
- With regard to water access among different types of uses and users, it is recommended that specific public policies be implemented to address the great asymmetry in groundwater access that

exists between the valley's stakeholders according to their economic capacity. Consideration should be given to the possibility of using financial mechanisms such as differentiated tariff schemes or cross-subsidies between types of uses and users that incorporate the problem of inequity to ensure minimum access to drinking water and sewerage services for local populations. The recent approval of a constitutional reform treating drinking water access as a basic right for all gives even more legal force to the use of economic instruments to ensure such access in specific situations.

- Regarding energy, it is recommended that certain objectives be incorporated into energy pricing policies to make this key input more accessible to the most vulnerable sectors (small farmers and inhabitants without secure access to water) while at the same time imposing a higher cost on the large-scale extraction of water by major users. Such a policy would complement the system of tariffs for actual water use and create a better balance in the unequal access to a vital resource. It is advisable to evaluate technological options for sustainable energy provision, such as photovoltaic equipment at an affordable cost for small producers.
- Lastly, it is recommended that water management policies should explicitly incorporate objectives for the restoration and enhancement of landscape resources that are vital for a territory such as the Ica Valley, where desertification has accelerated, with instruments for concerted planning on medium- and long-term objectives.

Meetings



Fifth Latin American Sanitation Conference

Among other things, the "Declaration of San José", signed by 19 countries of the region at the close of the *fifth Latin American Sanitation Conference* (Latinosan) (San José, Costa Rica, 1 to 3 April 2019), reaffirmed the region's commitment to recognizing water access and sanitation as human rights and to meeting the targets of the 2030 Agenda, particularly as regards universalization of high-quality water and sanitation services. The document calls for stronger international cooperation mechanisms and instruments for

sharing experiences, transferring technology and knowledge and introducing innovative management and financing models to supplement national efforts to move towards the fulfilment of SDG 6 "Ensure availability and sustainable management of water and sanitation for all". Similarly, the declaration highlights the commitment to increase budgets for drinking water supply, proper sanitation and hygiene in a sustained and substantial manner, whatever the financing source, as measured in relation to gross domestic product (GDP), and the agreement to improve the effectiveness and efficiency of expenditure on this, so that gaps in the provision of a safely managed drinking water and proper sanitation services can be gradually closed by 2030.

Latinosan conferences are international events held every three years with the objective of promoting access to sustainable, high-quality sanitation services (see Circular No. 44). The sixth edition of Latinosan will be held in the Plurinational State of Bolivia in 2022.



Economic Infrastructure Investment Data in Latin America and the Caribbean (INFRALATAM)

The objective of the *INFRALATAM* database is to measure investments in economic infrastructure (water and sanitation, flood defences, energy, irrigation, transport and telecommunications) in the countries of Latin America and the Caribbean, report their value, publicize the results and promote analysis of their impacts (see Circular No. 45). This work began in 2011 and currently covers 20 countries. It is being expanded and deepened jointly by the Development Bank of Latin America (CAF), the Inter-American Development Bank (IDB) and ECLAC, multilateral institutions that are deeply committed to the socioeconomic development of the region's countries.

Data for the drinking water and sanitation sector are likely to be incomplete and understate investment, especially from subnational, municipal and private sources. The following preliminary conclusions can be drawn for the sector:

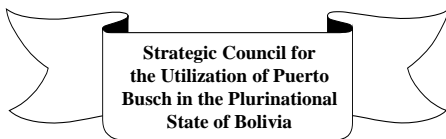
- Regional investment is currently put at about 0.22% of GDP. This percentage is

considerably higher than in the 1990s (0.18%) but still slightly lower than in the 1980s (0.23%).

- Investment is predominantly public (80%). At the same time, private investment is also substantial (20%).



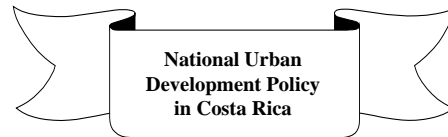
In Argentina, the *Interjurisdictional Environmental Health Board* (MISAm) was set up under Resolution 57/2019 to coordinate and expand public environmental health policy for the Matanza Riachuelo river basin outside the organizational structure of the Matanza Riachuelo River Basin Authority (ACUMAR) (see Circular No. 30). The purpose of MISAm is to develop a joint vision for the role of environmental health in the river basin and to generate joint working commitments between jurisdictions that enhance the reach and impact of public policies in the field of environmental health prevention and assistance for diseases with environmental effects, with priority given to finding ways to supplement these. ACUMAR formally offered membership of MISAm to the national Health Secretariat, the Ministries of Health of the Province of Buenos Aires and the Government of the Autonomous City of Buenos Aires, and the health authorities of the municipalities in the river basin.



In the Plurinational State of Bolivia, Supreme Decree No. 3826 created the *Strategic Council for the Utilization of Puerto Busch and the Paraguay-Paraná Waterway* (CEAPB-HPP) to analyse, evaluate and prepare projects, proposals and public policies for the utilization of Puerto Busch and the Paraguay-Paraná Waterway within the framework of the “Bolivia towards the Atlantic Ocean” Strategic Partnership for the Development of Puerto Busch. CEAPB-HPP will have the following main responsibilities:

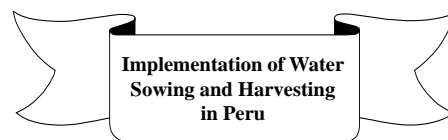
- Approving strategies and guidelines for concrete actions to make full use of Puerto Busch and the Paraguay-Paraná Waterway.
- Proposing guidelines for economic development policies and ways to strengthen them.
- Organizing the development of comprehensive logistics to promote freight traffic.
- Establishing the type of corporation and port management.
- Proposing regulatory development projects for the national and international levels.
- Recommending actions to promote the growth of sectors with a view to improving productivity and competitiveness.

- Promoting coordination with public and private bodies to develop incentive programmes for scientific and technological research.



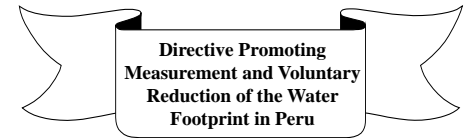
Costa Rica’s Ministry of Housing and Human Settlements (MIVAH) presented the *National Urban Development Policy 2018-2030*, officialized by Executive Decree No. 41136-MIVAH-PLAN-MINAE-MOPT, which was published on 8 June 2018. According to this national policy, the drinking water and sanitation services’ situation is as follows:

- Despite losses of the order of 50%, considering both leaks and consumption not charged for, it can be said that the country generally has a good level of drinking water coverage in homes. However, there are serious problems, such as: the availability of water to meet current and future demand in urban centres; the vulnerability of water resources to different natural and anthropogenic hazards that limit their quantity or quality; and the development and rehabilitation of infrastructure to sustain human consumption and urban development.
- When it comes to wastewater collection and treatment, the shortfall is considerable. The treatment of wastewater breaks down as follows: 70% goes into septic tanks; 13.4% is removed by sewers without a wastewater treatment plant; 8% is discharged into sewers with a treatment plant; 6.4% goes to a private treatment plant; and 2.2% goes into a latrine or the like. Considering only cantons with an urbanization level higher than 70%, the percentage of ordinary wastewater treated in urban areas is only 19.4%. In general, levels of sanitary sewerage coverage are low in relation to drinking water coverage, and treated sewerage coverage is even lower, especially in areas outside the Greater San José Metropolitan Area.



Peru enacted Law 30989 declaring *Implementation of Water Sowing and Harvesting a Matter of National Interest and Public Necessity* in the upper and middle reaches of river basins, and likewise the dissemination of traditional techniques of water sowing and harvesting. This law deals with integrated water resource management, good practices implemented in the upper reaches of river basins and their benefits for ecosystems and for people living in the lower parts of river basins. To this end, the different actions promoted in the existing regulations of

the Water Resources Act, the National Water Resources Plan, the National Water Resources Policy and Strategy, the National Environmental Policy, the National Agrarian Policy, the National Irrigation Policy and Strategy Guidelines 2015-2025 and the Law on Compensation Mechanisms for Ecosystem Services are coordinated for the purpose of promoting water replenishment at the headwaters of river basins and micro-basins and increasing water availability within a framework of integrated water resource management.



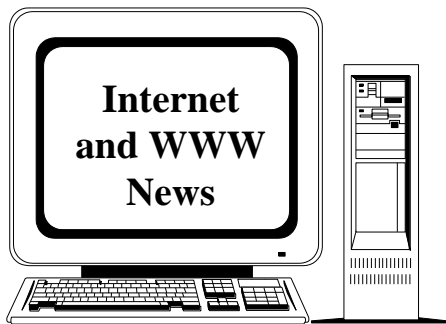
On 16 March 2018, Peru’s National Water Authority (ANA) issued Administrative Decision No. 104-2018-ANA approving the document “*Norma que Promueve la Medición y Reducción Voluntaria de la Huella Hídrica y el Valor Compartido en las Cuencas*” (*Directive Promoting Measurement and Voluntary Reduction of the Water Footprint and Shared Value in River Basins*). This is a directive whose purpose is to promote measurement and reduction of the water footprint and implementation of actions of shared value in river basins. It is national in scope and applies to holders of water use licences who voluntarily register in the Water Footprint Programme.

What is meant by the “water footprint” is the indicator of the total volume of water consumed in the production of goods or services, directly and indirectly, throughout the production process, and the potential impacts related to water resources. The Water Footprint Programme comprises the set of activities aimed at achieving a reduction in consumption and impacts due to water use and the development of socially responsible water-related actions that generate shared value in river basins. Registration in this programme is voluntary. The Blue Certificate is the recognition granted by ANA to users who participate in the Water Footprint Programme and successfully implement the commitments accepted under it.

The following documents must be submitted for registration in the Programme:

- The Water Footprint Report giving the Water Footprint analysis results for a product of the applicant’s that represents a significant impact on water consumption, as accredited by a reviewing body.
- A Water Footprint Reduction Project containing a voluntary and irrevocable commitment by the applicant to implement actions to improve water efficiency in its processes, such as improving the quality of wastewater and reclaimed water and optimizing the use of energy supplies and uses that affect the water footprint.

- A Water Shared Value Project containing a voluntary and irrevocable commitment by the applicant to implement actions to achieve one of the following goals: improving the supply of water (quantity and timeliness); improving access to drinking water, sanitation and hygiene; improving water quality by reducing pollution in natural water bodies; promoting implementation of integrated water resource management; protecting and restoring water-related ecosystems; and strengthening the participation of local communities in water management. These projects should be aligned with SDG compliance and implemented for the benefit of a local population, campesino community or native community.



The following websites about water-related issues are of particular interest:

- The *Red de Municipios ante el Cambio Climático* (*Network of Municipalities Coping with Climate Change*) is a community open to all municipalities in Chile wishing to commit themselves explicitly to planning and managing their territory in the light of climate change, considered as the scenario determining the challenges for the twenty-first century. The Network is a forum for cooperation, training and the sharing of experiences on climate change between municipalities in Chile (<http://www.redmunic.cl>).
- The newsletter of the *United Nations Educational, Scientific and Cultural Organization (UNESCO) Chair on Hydrometeorological Risks* can be viewed at <https://www.udlap.mx/catedraunesco>.
- The *River Pánuco Basin Council* in Mexico was created on 26 August 1999 as a coordination and consultation body between federal, state and municipal departments and agencies and the representatives of users of the river basin, with a view to formulating and executing programmes and actions for better water management, the development of infrastructure and related services and the preservation of the resources of the hydrologic regions (<http://www.ccrp.org.mx>).
- The LinkedIn group, “*Water Economics*”, allows water economists to exchange knowledge and ideas on the topic and to build a global network. Subjects discussed are related to water safety, quantity, quality, cost, regulation, efficiency and pricing.
- The Organization of American States (OAS) has published the report “*Implementation of the Human Rights to Water and Sanitation through the Inter-American Program for Sustainable Development of OAS*”, which characterizes the human rights to water and sanitation, in consideration of the 2030 Agenda and the SDGs (<http://www.oas.org>). The study describes the cases of Costa Rica, Mexico, Honduras and the Dominican Republic to analyse the implementation of these rights.
- Issue 127 (April 2019) of *CEPAL Review* addresses different areas of the economic and social situation of several countries in the region, paying special attention to the problems of natural resource dependence and the challenges of innovation (<https://www.cepal.org>).
- *Sendas del Agua* (*Water Pathways*) is a newsletter produced by the Communications Unit of the Chilean Department of Water (DGA), containing news about the work of this agency in the areas of hydrology, surveys and planning, water rights, conservation and protection of water resources, organizations of water users, enforcement, glaciology and reform of the Water Code (<http://www.dga.cl>).
- The publication, “*The Water-Energy-Food Security Nexus: a review of Nexus literature and ongoing Nexus initiatives for policymakers*”, seeks to provide an overview of the literature covering the water, energy and food nexus topic, with a discussion of how the approach can be effectively implemented on the ground (<https://www.water-energy-food.org>). It also summarizes ongoing nexus initiatives and regional applications. In addition, it provides a summary of recent research findings on key topics of relevance to the assessment of the nexus and its interventions.
- The *Peruvians without Water Movement* (MPSA) is an association committed to complying with the SDGs relating to the issue of drinking water, sanitation and the environment by means of participatory projects in peri-urban and rural areas. Its aim is to guide efforts to find solutions for providing an adequate supply of drinking water and basic sanitation services to the populations of marginal settlements (<http://www.lossinagua.org>).
- Set up in 2011, the *Latin American Water Funds Partnership* is an agreement between a number of stakeholders aimed at contributing to water security in Latin American and Caribbean countries by creating and strengthening Water Funds (<https://www.fondosdeagua.org>).
- The *Argentine Network for Training and Capacity-Building in Integrated Water Resources Management* (Arg Cap-Net) is a network of Argentine institutions that carry out capacity-building to promote integrated water resources management. Its members are organizations in charge of water management, non-governmental organizations whose missions include the protection of water resources and the environment, river basin organizations, companies providing drinking water and sanitation services, and universities and institutes of science and technology engaged in human resources training, research and the implementation of studies and projects for the rational use and preservation of water resources (<http://www.argcapnet.org.ar>).
- The document “*Guía para el diseño de proyectos de telemetría hidrométrica*” (*Guide for the design of hydrometric telemetry projects*), prepared as part of the Norte Chico Water Programme in Chile, presents a guide to the application of technological standards for hydrometric telemetry for the purpose of designing water measurement and control systems in the country’s river basins and pursuing interoperability between equipment from different manufacturers and between public and private networks (<http://repositoriodigital.corfo.cl>).
- The mission of the *Caribbean Institute for Meteorology and Hydrology* (CIMH) is to assist in improving and developing the meteorological and hydrological services, as well as raising awareness of the benefits of meteorology and hydrology for the economic well-being of the CIMH member States. This is achieved through training, research, investigations, and the provision of related specialized services and advice (<http://www.cimh.edu.bb>).
- The *Aquatic Resources Authority of Panama* (ARAP), created by Law No. 44 of 23 November 2006, is the State lead agency for overseeing and enforcing compliance with laws and regulations on marine and coastal resources and aquaculture, fisheries and related activities (<http://arap.gob.pa>).
- The *National Environmental Sanitation Service* (SENASA) of Paraguay is an agency reporting to the Ministry of Public Health and Social Welfare (MSPBS), created by Law No. 369/72 of 1 December 1972 (<http://www.senasa.gov.py>). It carries out several functions in environmental sanitation activities, namely planning,

promotion and execution of works aimed at extending the provision of drinking water and sanitation services. It has jurisdiction over settlements of up to 10,000 inhabitants.

- The **Caribbean Desalination Association** (CaribDA) is a non-profit organization that represents members from the Caribbean desalination and water reuse communities, utilities, industries, academia and government, as well as individuals interested in water supply improvement in the Caribbean, specifically by means of desalination or water reuse (<https://www.caribda.com>).
- In November 2018, the Council of the European Union adopted **new conclusions on water diplomacy**, which underline the link between water, climate, security and peace and promote accession to and implementation of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (<https://www.consilium.europa.eu>). These conclusions set out a new approach to water that reflects increasing challenges (such as climate change or growing water insecurity) and the impact on European Union water diplomacy of both the 2030 Agenda for Sustainable Development and the Paris Agreement.
- The **Caribbean Water & Sewerage Association Inc.** (CAWASA) is a regional organization of water utilities dedicated to serving the growth and development of its members (<http://cawasa.org>).
- In the case of Mexico, the **Social Pact for Water** is an instrument for dialogue and social interaction aimed at creating a

shared vision and guiding and leading efforts by the government and society to manage water resources sustainably and achieve long-term water security (<http://pactosocialagua.mx>).

- **FUNCAGUA** is a water fund whose mission is to contribute to the long-term availability of water for the Guatemala City metropolitan area by raising awareness about responsible water use and carrying out efficient conservation and risk reduction actions by means of public-private partnerships that ensure financial sustainability (<https://funcagua.org.gt>).

Publications



Recent publications by the Natural Resources Division on water resources management and provision of drinking water and sanitation services:

- “**El Agua como Motor de Desarrollo**” (*Water as an Engine of Development*) (publication pending) by Humberto Peña, Miguel Solanes and Andrei Jouravlev. This study is an edited, supplemented and updated version of the Regional Report for Latin America and the Caribbean prepared by the Natural Resources Division in collaboration with the Inter-American Development Bank (IDB) as part of the Americas Regional Process to prepare for the eighth World Water Forum (see Circular No. 49). The report argues that the

role of water in the economy and its contribution to the well-being of countries depends on a set of economic, social and geographical factors that are external to water resources management, and also on how the institutional system responds to the characteristics of the resource and the challenges of development. Thus, the uncertainties that matter most are economic, political and ecological rather than hydrological. These exogenous factors include: disruptive technologies that alter traditional socioeconomic parameters; demographic changes and the emergence of the middle class; urbanization and the expansion of metropolitan areas; climate variability and change; the state and quality of macroeconomic contexts; the requirements of democratic governance under new economic, social and technological conditions; and natural resource scarcity in the context of global markets. The study identifies four regional challenges: drinking water and sanitation; sustainable productive development; conservation of water bodies; and flood protection. In addition, proposals are made for governance and financing and for efficient, high-quality drinking water services for all.

The publications of the Natural Resources Division are available in two formats: (i) electronic files (PDF) which can be downloaded from <http://www.cepal.org/dmri> or requested by email from silvia.saravia@cepal.org; and (ii) printed (hard) copies which should be requested from the Publications and Web Services Division (either by email to publications@cepal.org or by mail to ECLAC Publications, Casilla 179-D, Santiago, Chile).

UNITED NATIONS

NACIONES UNIDAS



NATIONS UNIES

Economic Commission for Latin America and the Caribbean (ECLAC)

Natural Resources Division

Casilla 179-D

Santiago

Chile

PRINTED MATTER
AIR MAIL