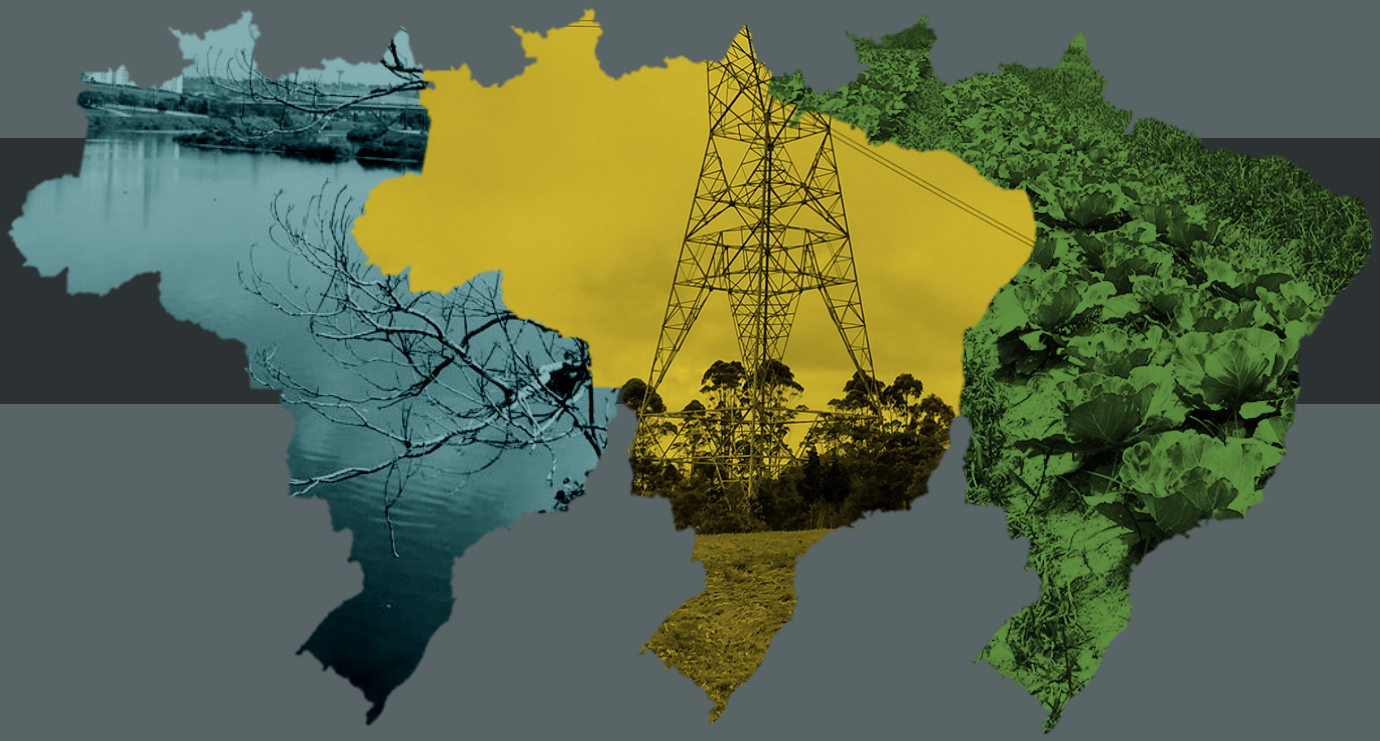
THE WATER-ENERGY-FOOD NEXUS

WHAT THE BRAZILIAN RESEARCH HAS TO SAY



Edited by
Fabiano de Araujo Moreira
Michele Dalla Fontana
Tadeu Fabrício Malheiros
Gabriela Marques Di Giulio

USP
Universidade de São Paulo

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DOI 10.11606/9786588304075

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Universidade de São Paulo
Faculdade de Saúde Pública
São Paulo
2022

PHOTOGRAPHY
Photos from the South Zone of the city of São Paulo, Brazil: Fabiano de Araujo Moreira

ENGLISH VERSION PROOFREADING
Beatriz Pagamisse

ART & GRAPHIC DESIGN
Juliana Camargo

TECHNICAL SUPPORT
Faculdade de Saúde Pública's Library Team

Av. Dr. Arnaldo, 715
01246-904 – Cerqueira César – São Paulo – SP
http://www.biblioteca.fsp.usp.br
markt@fsp.usp.br

Cataloging-in-Publication
Universidade de São Paulo. Faculdade de Saúde Pública

W324 The Water-energy-food nexus: what the Brazilian research has to say [electronic resource] / Edition: Fabiano de Araujo Moreira... [et al.] – São Paulo : Faculdade de Saúde Pública da USP, 2022.
291 p.

ISBN (PDF) 978-65-88304-07-5
DOI 10.11606/9786588304075

1. Water-Energy-Food Nexus. 2. Sustainable Development. 3. Resources Management. 4. Brazil. I. Moreira, Fabiano de Araujo. II. Dalla Fontana, Michele. III. Malheiros, Fabrício. IV. Di Giulio, Gabriela Marques.

CDD 333.7

Elaborada por Alice Souza - CRB 8/6238

FOREWORD

The Food-Water-Energy (FWE) nexus represents first and foremost a perspective, a way of looking at the world, at problems, at solutions. It provides a view of the three key resource systems of food, water, and energy, not in isolation, but as one system, with many and diverse cross-linkages between the subsystems. So, analytically speaking, it is a unifying concept, a much-needed antidote against the unrelenting pressures towards reductionism, silo-thinking and hyperspecialization. From my original background as a systems ecologist, understanding ecosystem functioning in terms of connected flows of energy and matter, is self-evident and lies at the roots of this discipline. However, human society and its interactions with the natural environment form a highly dynamic social-ecological system of such dazzling complexity, that reductionist approaches seem inevitable to make research and management feasible at all.

Nevertheless, the linkages between the resource systems of food, water and energy are real, and at some point in time create impacts of such magnitude that they can no longer be ignored. We can see this reflected in the history of the FWE nexus concept. In its first form, the concept made its appearance as the Food-Energy nexus in the 1980s. The attention to the interactions between food and energy was sparked by the energy crises and famines in the 1970s. There was a widespread concern that the rising costs of energy would hamper a further increase in food production in developing countries, so that productivity would not keep up with population growth. Research focused for example on alternative energy sources, such as locally produced biogas. In the 1990s, after the 'UN Conference on Environment and Development' in Rio de Janeiro (1992), the nexus concept made way for the more encompassing concept of sustainable development. Yet, in the early 2000s, the concept made its re-appearance in the form of the Water-Energy nexus, this time motivated by concerns about a looming global water crisis, as well as the negative impacts of large hydropower projects. Towards the end of the 2000s, worries about negative impacts of energy crops for biofuel production grew stronger and now more and more publications about this issue started to refer to the 'full' FWE nexus. And after the 2011 Bonn conference on 'The Water, Energy and Food Security Nexus: Solutions for the Green Economy', the amount of research and policy publications on the nexus has exploded. Novel, prominent contexts are sustainable development, energy transition and circular economy.

As also outlined in the introductory chapter, the nexus literature has been criticized for being geographically biassed, in the sense that knowledge

is mainly produced by institutions in the Global North, while often meant to be applied in the Global South. Although this probably still applies for most development-oriented research, it does not for nexus research in Brazil, as this book clearly shows. This may not be so surprising, however, given that Brazil is home to both major FWE nexus-related issues such as biofuel production and hydropower, and a highly developed system of universities and research institutes.

The timing of this book is interesting. Ten years after the seminal conference in Bonn, the nexus concept is being increasingly criticized for being vague, abstract, too broad (or too narrow), and above all, impractical. However, what this book makes clear is that the nexus concept not only provides an integrative perspective on the three resource systems, but also that it is a concept that is fruitful in many different disciplines in both the natural and social sciences. This shared interest across a wide range of disciplines offers welcome opportunities for increasingly interdisciplinary studies and understanding. As there is also active interest from policy makers, even a transdisciplinary approach is within scope. Both approaches are much needed to enable the move from knowledge and understanding to practical implementation and real-world problem-solving.

This development is not just wishful thinking: this book already presents some actual examples of inter- and transdisciplinary approaches, with the FWE nexus as a shared lens to better see where problems occur and where sustainable solutions can be found. This makes the book guaranteed an interesting read that will hopefully stimulate a further uptake of these integrative approaches.

Prof. Dr. Joop de Kraker
Professor of Sustainability Assessment, Maastricht Sustainability Institute
The Netherlands
Project leader GLOCULL (Globally and Locally Sustainable Food-Water-Energy Innovation in Urban Living Labs), Sustainable Urbanisation Global Initiative, Belmont Forum & JPI Urban Europe

ACKNOWLEDGEMENTS

The editors would like to thank the authors for their contributions to the book, and the publishing commission of the School of Public Health at the University of São Paulo for their support. This book has been developed in the scope of the Project GLOCULL - "Globally and LOCally-sustainable food-water-energy innovation in Urban Living Labs" (FAPESP – São Paulo Research Foundation, Proc. 2017/50423-6, Proc. 2018/21249-0; Proc. 2018/21362-1).


ENERGY

SUMMARY

CHAPTER 3

Instruments of environmental and productive intervention from the perspective of the nexus water, energy and food: an analysis of the context of the Cantareira Water Production System

By Rafael Eduardo Chiodi[1], Junior César Avanzi[1], Bruno Montoani Silva[1], Philipe Stéphano Gonçalves Corrêa[1], Alexandre Uezu[2]

1 Federal University of Lavras (UFLA-Brazil)
2 Institute for Ecological Research (IPÊ-Brazil)

1. Introduction

The management of strategic resources such as water, energy and food in a segregated way is a source of conflict, reflecting inefficiency and unsustainability. Faced with a complex and interrelated reality, sector management is highly limited to contribute to sustainable development (Hoff, 2011; Olawuyi, 2020).

Recognizing this problem has motivated the emergence of new concepts that try to overcome the deficiencies in the sectoral management of natural resources. In this sense, there is the concept of nexus water, energy and food. The nexus can be understood as a theoretical-methodological approach that starts from the recognition of the interdependencies between the water, energy and food systems in order to promote more efficient and sustainable intervention instruments, aiming to reduce conflicting exchanges (trade-off) and increasing synergies between the systems (Hoff, 2011; Flammini et al., 2014).

In its applied dimension, the nexus approach aims to assess contexts, considering the instruments of interventions for sustainable development (Flammini et al., 2014). In this perspective, analyzes based on the nexus seek to provide policy makers with information for a systemic understanding of sensitive socioenvironmental contexts, supporting actions that contribute to promoting the Sustainable Development Goals (Olawuyi, 2020).

For nexus interventions have long-term impacts, they must count on adequate institutional arrangements. From said institutional arrangements, it is expected objectives that integrate the interests of different sectors (multicentric), involve multiple stakeholders (politicians, technicians and civil society), in addition to act within adjusted scales to obtain results (Hoff, 2011; Allouche et al. 2014; Flammini et al., 2014; Benson et al., 2015).

It is understood that the sectorial management is also materialized through intervention instruments used to shape the behavior of social stakeholders (Flammini et al., 2014). Thus, here the focus is placed on the integration between instruments, which promote environmental conservation, and productive development in rural areas, since these instruments are related to the water resources management, the food production and bioenergy.

From this point of view, the nexus approach was used to understand the context of the Cantareira Water Producing System. The Cantareira System is the main system that supplies water for the Metropolitan Region of São Paulo, covering a drainage area of approximately 228 thousand hectares, located

partly in the state of São Paulo and Minas Gerais (Uezu et al., 2017).

In 2011, about 62% of this area was occupied by cattle ranching and eucalyptus forestry (Uezu et al., 2017). Hence, the way the soil is managed in these activities can affect the physical properties of the soil, such as water infiltration, redistribution and storage, therefore, it interferes in the recharge capacity of the water tables, and with the maintenance of continuous flow of the water in springs, streams and rivers, consequently, influencing on the regional hydrological regime (Lima, 2006).

Cattle ranching is used for meat and milk production. This activity comprises the set of economic strategies of rural families, as well as guaranteeing the supply of food at the local and regional level. Eucalyptus forestry is interrelated with livestock, as it is the first productive investment alternative to livestock. Eucalyptus monoculture is used for different purposes, but the production of firewood and charcoal stands out (Chiodi et al., 2019).

The use of nexus approach in this context consists of centralizing the environmental, socioeconomic, and political dimensions surrounding the activities that produce food and bioenergy in the region. Cattle ranching and eucalyptus monoculture are important for they occupy the soil predominantly, they promote effects on hydrological conditions, supply markets and are economic activities that make up the social reproduction strategies of a significant portion of the rural population (Chiodi et al., 2019).

In this context, this chapter identifies the main instruments that promote environmental conservation and sustainable development that affect these productive activities, aiming to discuss the perspective of integration based on the water, energy and food nexus. In doing so, it delimits the context of the study. It describes the instruments identified based on their central objectives, stakeholders involved in their implementation and scales of application. Finally, it reflects on possibilities and limits that the nexus approach allows for the management of natural resources in the context of the Cantareira System.

2. Methodology

The "context of the Cantareira System" was defined as the watersheds of its water reservoirs, or more precisely, the nine municipalities that make up 98.1% of this area, which are Camanducaia, Extrema, Itapeva and Sapucaí-Mirim in Minas Gerais, and Joanópolis, Mairiporã, Nazaré Paulista, Piracaia and Vargem in São Paulo (Figure 1) (Uezu et al., 2017).

In this context, the main intervention instruments for environmental conservation and productive development related to cattle ranching and eucalyptus planting were identified. These "intervention instruments" may be understood as formal institutions (laws, norms, policies) and actions that promote both the preservation and conservation[3] of the natural resources (forest, soil and water) as support for these productive activities. It was sought to identify the instruments to point out elements that demonstrate integration between interventions for environmental conservation and agricultural development.

The "land use and occupation" was central to the definition of the integrated elements of the intervention instruments. The integrated elements are those that aim to establish means for the conservation[4] of natural resources, not inhibiting the land use for productive activities. On the other hand, the non-integrated elements hinder the productive land use (livestock and eucalyptus) or such use negatively affects the attributes related to natural resources, compromising their functions at some level (degradation).

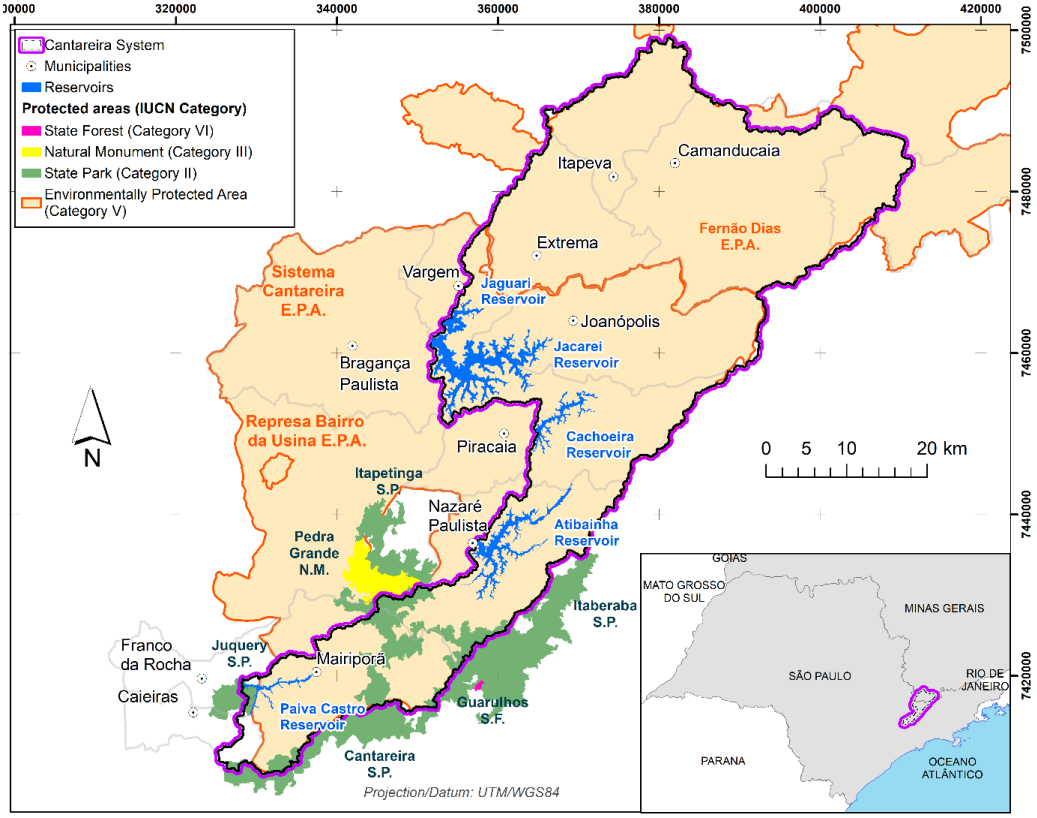

Figure 1. Delimitation of the drainage area of the water reservoirs of the Cantareira System with the subdivision of the territories of the municipalities and conservation units.
Source. Elaborated by the authors.

3 Preserving refers to the prohibition of the economic exploitation of natural resources, while conserving allows the economic exploitation of natural resources in a sustainable way.

For this study, primary and secondary data were evaluated. In the field research (primary data), the instruments were identified, and aspects of their application were captured, based on the perception of their managers. Representatives of the State Forestry Institute of Minas Gerais (SFI/MG), the Forestry Foundation of São Paulo (FF/SP), the State Technical Assistance and Rural Extension Company of Minas Gerais (STARE/MG) were interviewed, as were the Coordination for Sustainable Rural Development of São Paulo (CSRD/SP), municipal secretaries for the environment (Extrema, Camanducaia, Itapeva, Mairiporã, Joanópolis Municipalities) and the Institute for Ecological Research (IER). Altogether, twelve interviews were carried out, which took place from an open question script (Richardson, 2010) between 2017 and 2020.

Secondary data were collected in the database of the 2017 Census of Agriculture, the National System of the Rural Environmental Registry and in technical, legal and scientific documents.

3. Intervention instruments

Different instruments were identified aiming at environmental conservation and productive development. Here, the focus is on the most comprehensive ones, which were aggregated in three categories: institutions for environmental protection, instruments for forest restoration and instruments of productive incentive.

3.1 Institutions for environmental protection

The Forest Code (FC) and the Protected Areas (PAs) stand out as environmental protection institutions. Both are responsible for their applications by the state environmental agencies (SFI/MG, FF/SP and State Secretary for the Environment/SSE-SP). The partnership with the military police and, in the case of PAs, management councils composed of representatives of States, municipalities and civil society is known for its compliance with the FC.

The FC is the main environmental policy that falls on the rural property, having two central provisions: (i) that a percentage of the area of the rural property, variable for each biome, must be maintained with native vegetation as a Legal Reserve (LR); and, (ii) the obligation to maintain Permanent Preservation Areas (PPAs) with native vegetation cover, which encompass the surroundings

of springs, water courses, hill tops and sloping areas (greater than 45 ° or 100%).

Depending on the physical-geographic context, PPAs impose serious restrictions on agricultural use of the soil, especially in the context of the Cantareira System. In the studied municipalities group, on average, approximately 60% of agricultural establishments had the presence of springs and water courses (Instituto Brasileiro de Geografia e Estatística – IBGE, 2017). This hydrographic network, in addition to the mountainous relief and the small rural properties predominance, sets up a scenario of strong legal impediment to land use.

When considering PAs, state parks (SP) and environmental protection areas (EPA) are noticeable (conservation unit – CU). In general, both categories have objectives related to the conservation of forests, biodiversity, and important water resources for the Metropolitan Region of São Paulo (Uezu et al., 2017).

The State Parks (SP) (Cantareira, Juquery, Itapetinga and Itaberaba) are fully protected. Since they are territories created for preservation, private properties in their interior must be expropriated to inhibit any use of the land, a fact that causes conflicts with producers in the region. As shown in Figure 1, the SPs are concentrated in the south of the Cantareira System area.

An interviewed manager reported that despite the importance of PEs for the Cantareira System, there are serious difficulties for them to be effective in protecting the territory, given the deficit of financial, human and infrastructure resources. The lack of resources to expropriate properties, the occurrence of invasions and the limited capacity to inspect the territory are factors that create conflicts when applying this instrument.

On the other hand, the Environmental Protection Area is a more integrated instrument, as it aims to make environmental conservation compatible through the sustainable use of natural resources in private properties. The Cantareira System area in São Paulo has a territory within the EPA Piracicaba/Juqueri-Mirim Area II and the EPA System Cantareira and, in Minas Gerais, the EPA Fernão Dias (Figure 1).

Although EPAs have the specific objective of promoting sustainable production, its effectiveness is limited. Through interviews with managers, it was identified that among the challenges to promote environmental conservation in the EPAs' territory, is involving very large territories, where there must be integration between public and private interests.

3.2 Instruments for forest restoration

Among the instruments for forest restoration, we highlight the initiatives of Payment for Environmental Services (PES). The PES can be understood as a transfer of resources between social stakeholders, which aims to create incentives to align individual or collective decisions on land use with the social interest in the management of natural resources (Muradian et al., 2010).

In the context of this study, the PES is materialized by the financial payment to the owners that allow conservation practices to be carried out on their properties. It is also worth mentioning the Water Conservation Project conducted by the Municipality of Extrema together with several partners, and the Water Producer Pilot Project undertaken in a partnership by The Nature Conservancy, CSRD/SP, SMA / SP, municipal governments of Nazaré Paulista and Joanópolis, among others.

Despite the financial payment having visibility, according to the manager of the Water Conservation Project, this is the means to achieve forest restoration within private properties. Thus, the PES is considered an instrument for complementary conservation to the FC (Brasil, 2012), because when promoting forest restoration, the areas will be protected by its provisions. However, such complementarity occurs at the sectoral level, as it integrates instruments for environmental preservation.

At the intersectoral level, PES initiatives invest in soil and water conservation practices, such as rainwater containment basins and agricultural terraces. These practices favor the processes of water infiltration in the soil and reduce the erosion rates, which are directly linked to the quality and quantity of water, and do not inhibit the productive use by agriculture and livestock. Thus, such practices are elements that are understood to be integrated with PES initiatives, since they promote soil and water conservation and encourage agricultural productive activities.

3.3 Productive incentive instruments

Among the instruments of productive incentive, the rural credit stands out, for it aims at the costing (finance expenses of the production cycle) and the investment (finance expenses of implantation of crops, acquisition of animals and equipment) of agricultural activities. Credit operators are public and

private banks, and producers generally receive technical advice for the credit projects preparation.

In this instrument, an element that is integrated with the environmental policy is the determination that banks can only grant credit for activities that will be developed in properties which are registered in the Rural Environmental Registry (RER). Despite a relevant measure, the RER, the designated main control tool of the FC, represents a statement on the property state of use and does not necessarily guarantee compliance with the law. Therefore, there is no certainty about the real environmental counterpart on the producers' part to access rural credit.

For eucalyptus silviculture, forest promotion is an instrument to encourage the planting of the species. Forest promotion actions come from both the public and private sectors. In Minas Gerais, the SFI has an endeavor to produce and donate eucalyptus seedlings. According to a technician from the agency, about 40,000 seedlings are produced and donated annually. The seedlings are donated without proper monitoring by the technicians in relation to where to plant, therefore, there is no effective control of compliance with environmental legislation by producers.

In São Paulo, the Forest Savings Program aims to encourage farmers to plant eucalyptus as an income option, based on a public-private partnership. Suzano Company is the proponent of the program, and CSRD/SP provides technical assistance to producers in the planting process. In the program, the producer receives a package (seedlings, fertilizers, pesticides) from the company and is given the purchase of guaranteed production. Meeting the environmental legislation is a requirement of the program for the adhesion of producers. Despite this determinant, the promotion of monocultures in water sources areas is controversial, with eucalyptus being pointed out as potentially harmful in water sources (Castro & Morrot, 1996).

Among the instruments identified, the dairy production initiatives in rotated grazing systems deserve to be highlighted. These systems are encouraged by both public bodies and a civil society organization.

In the public sphere, in both states there are programs to promote dairy production. CDRS / SP develops the CSRD Milk Program and STARE/ MG executes the Minas Milk Program. These programs, through technical assistance and rural extension, support producers in converting production systems. Despite having few producers involved, these are model producers to encourage others to adhere to the rotated grazing system.

Within the scope of civil society, there is the "Sowing Water Project" of the Ecological Research Institute. According to the project coordinator, IER has been operating since 2010, supporting rural producers interested in rotated systems. Efforts continue to promote ecological management of pastures on "model" properties. Until 2020, eight properties underwent conversion processes between systems, these becoming support units for training courses for producers, in addition to being "laboratories" for studies on the environmental and economic benefits of these production systems.

Rotational management has advantages over traditional extensive grazing. This system, following the division of the area into plots and paddocks, promotes less animal trampling, and thus reduces soil compaction, which favors greater water infiltration and percolation, greater aeration and growth of the root system, and therefore less soil erosion. Consequently, such initiatives create synergies between food production and water conservation, benefiting water producers and users.

Given the above, Table 1 presents a synthesis of the instruments identified with their classification elements.

Instrument		Sector of Origin	Scale	Integrated Elements	Non-Integrated Elements
Environmental Protection	Forest Code	State-Owned	National	_	Forbit Agriculture in PPA e LR
	State Parks	State-Owned	Territory CU	_	Forbid Productive Use
	EPAs	State-Owned	Territory CU	Sustainable Land Use	_
Forest Restoration	PES	State-Owned	Hydrographic Basin	Soil Conservation Practices	Forest Restoration
Productive Incentive	Rural Credit	State-Owned and Private	Rural Property	To Posses RER	Conventional Production
	Forestry promotion	State-Owned and Private	Rural Property	Environmental Adequacy	Monoculture
	Rotational Grazing	State-Owned and Civil Society	Rural Property	Soil and Water Conservation	Monoculture

Table 1. Intervention instrument, sector of origin, scale of intervention, integrated and non-integrated elements in the context of the Cantareira System, in 2019.
Source. Elaborated by the authors.

4. Discussion

All the identified instruments come from or have the participation of state agencies (state or municipal level), a fact that demonstrates the role of

the State as a formulating and executing agent for environmental conservation and productive development instruments. Although noting the participation of civil society and private sector, the centrality of state action raises questions regarding the forms of State organization as fundamental to the nexus water, energy and food.

All the instruments express the sectorial character of state origin, since the environmental protection institutions and the instruments of forest restoration start from environmental agencies, which act within the scope of environmental policies, and the instruments of productive incentive come especially from rural credit policies and technical assistance, and rural extension services.

This result alludes to the sectoral organization of the Brazilian State in the context of the formulation and implementation of public policies. Sectoral structures are characterized by the existence of isolated government agencies, by spatially and functionally limited jurisdictions, by restrictive financing mechanisms, and by legislative and regulatory barriers that impose obstacles to the perspective of integrated confrontation of socio-environmental issues (Allouche et al., 2014).

Understanding the sectoral arrangement from which interventions emerge is the starting point for reflecting on the possibilities of the nexus approach. However, the alternatives to overcome this obstacle are open within the scope of the nexus. The question that arises is: to activate nexus governance and intervention processes would it be necessary to build new institutional arrangements, or would it be feasible to induce efforts to adapt the pre-existing ones? (Flammini et al., 2014).

It is agreed here with Mercure et al. (2019), that it is not essential to create ministries, secretariats, integrated bodies, or even a Nexus government department, but to improve the science-political interface in governance institutions to make them specialists in the nexus. For the authors, the assistance of nexus experts (policy analysts, technical experts, legal experts) with policy makers and interested parties can lead to the transmission of their views and knowledge, which may favor adjustments in their action strategies. Thus, the bridge between science and politics should be used continuously so that the nexus approach can be assimilated within each sector.

Furthermore, the delimitation of a spatial scale is equally relevant to guide nexus intervention processes, since each system works under different scales (Flammini et al., 2014). In the studied case, the instruments for environmental conservation intervene at different scales: national, territorial, municipal and

watershed; those for productive development focus on rural properties. For Leck et al. (2015), this dimension adds complexity to the nexus due to issues related to the possibilities of synchronizing interventions within existing regulatory and administrative systems.

Even recognizing that multiple scales emerge as obstacles to the nexus approach, it is necessary to highlight rural property as a common scale. The FC is an institution of national application, but it provides for rural properties; PES initiatives are designed from the hydrographic basin, yet their actions fall on private properties; and, although EPAs have wide territories, there is a need to generate effects on private property.

In this way, the performance guided by a common scale gives meaning to the participation of the stakeholders by contextualizing the interrelated problems (Benson et al., 2015). The ideal scale of intervention depends on each reality, and in the context of analysis, there is a fine scale in rural private property to synchronize interventions with a focus on the nexus, allowing it to be integrated with other scales of interest to water security. This perspective can be extrapolated to the national level, since around 64% of the Brazilian territory (543 million hectares) is already being declared as a private domain (Cadastro Ambiental Rural - CAR, 2020).

However, pointing out an ideal nexus intervention scale does not solve the problem of the effectiveness of interventions. In the context of the Cantareira System, private land ownership imposes itself as a formal institution that limits the effectiveness of instruments for environmental conservation. The dependence on rural property to generate income and the sense of absolute usufruct over private property, largely explain scenarios of non-compliance with the provisions of the Forest Code (Chiodi et al., 2013).

In the field of possibilities of the nexus practical effectiveness, it is opportune to bring the comparative perspective of participatory and integrated water resources management (Benson et al., 2015). In Brazil, it took shape with the National Water Resources Policy (Law 9.433 / 1997). Social participation in the space created by the Hydrographic Basin Committees (HBC) was shaped by calling for the participation of the public sector, users, and the community with a view to establishing priorities and making decisions for a consensual management of water resources. Thus, integrated management was proposed to contemplate the multiple uses made by different sectors of water resources.

After 24 years of the model, although recognizing relevant advances, the gaps for integrated management are still clear. The study context is privileged

for such an appointment, since it is one of the most advanced in its effectiveness. If, on the one hand, the creation of HBCs (Piracicaba, Capivari and Jundiaí) enabled shared water management spaces, on the other hand, these spaces present problems. It starts with the exclusion of important stakeholders, such as small rural producers. The dominance practiced by the state segment in formulating the agenda and conducting discussions also limits the active participation of other sectors (Alvim et al., 2008). And, precisely at a crucial moment to carry out integrated management, that of the water crisis between 2013 and 2015, the model was disfigured by the centralizing and technocratic action of state sectoral stakeholders (Puga, 2018).

Therefore, in addition to the challenge of achieving greater coherence between sectoral policies (Mercure et al., 2019), what the trajectory of integrated water resources management can show to those applying the nexus approach is how these policies materialize. It is noticed that even with an institutional arrangement set up to promote integrated and participatory management, characteristics such as authoritarianism, centralized action and exclusion emerge to distance the possibilities of full integrated management. In view of these challenges, it is understood that the nexus approach offers little in the way of overcoming these issues.

In any case, it was identified that non-integrated sectoral elements are linked to the central objectives of the analyzed instruments. The FC aims to protect forests in private areas, SPs to inhibit any productive use in their territory and PES initiatives to restore forests. Instead, rural credit, forest promotion and rotational grazing systems foster monocultures. Thus, it is assumed that forest protection and restoration inhibit productive uses and monocultures cannot be considered as sustainable systems in areas of water sources.

This result refers to the dilemma between privileging environmental conservation or agricultural production in the context of public interventions. In addition to this dilemma being the basis of the perspective of sectoral intervention, therefore, generating socio-environmental conflicts, it is configured in the original problem that the concept of sustainable development proposes to overcome.

Contrastingly, when focusing on integrated elements, they clearly assist the central objectives of the instruments. The FC may make exceptions for the recovery of PPAs and LRs with sustainable practices for family farming, the PES initiatives combine soil conservation practices, rural credit, and forestry promotion by requiring the Rural Environmental Registry to induce the environmental adequacy of the property rural to the FC.

However, it is understood that such a degree of integration between the instruments is less than expected for the nexus approach, since this part of a deep understanding of the interdependencies between water, energy and food, these resources being perceived within interconnected systems (Mercure et al., 2019).

5. Conclusions

In the context of System Cantareira, the nexus water, energy and food refer to the interrelations that occur in the context of land use, especially between the production of bioenergy and food and dimensions of regional water security. These systems are influenced by different intervention instruments, which are materialized in environmental protection institutions, forest restoration instruments and productive incentive instruments.

Such instruments are strongly associated with state intervention, clearly expressing the sectoral characteristic based on their objectives, the executing stakeholders and the scales of intervention. If the sectoral management of nexus resources is precisely the starting point for changes towards greater integration, the trajectory of combined management of water resources demonstrates obstacles for a nexus model to materialize effectively.

The perspective compared to the integrated management of water resources provides lessons for the application of the nexus approach in the Brazilian context. Obstacles such as authoritarianism that emerges in instances of said management, centralizing actions by the state sector and the exclusion of central actors for the administration of natural resources are placed ahead of the realization of nexus governance. In this sense, even the search for the improvement of the science-politics interface in governance institutions does not allow us to understand that these obstacles can be easily overcome by applying the nexus approach.

Furthermore, as the advance of occupation of the Brazilian territory through the domain of private property is identified, another challenge is to promote the sustainable management of nexus resources based on such a scale. In this sense, in addition to the search for the development of instruments that integrate environmental, productive and socioeconomic objectives, these will need to be effective inside private properties.

It can be considered that the identified intervention instruments are positioned at a starting point of what is understood as an integration process

capable of suppressing conflicts of interest. The integrated elements identified are clearly ancillary to the instruments' central objectives, which reveal themselves to be deeply sectoral. As part of the analyzed instruments having national application, the configuration of the studied context may, to some extent, also reflect a national reality.

If the nexus approach opens up new opportunities to improve political, economic and social processes towards the Sustainable Development Goals, the carried out analysis shows that a huge distance has to be covered for the realization of such perspective.

Acknowledgements

Acknowledgements to the National Council for Scientific and Technological Development of Brazil [Process 441244/2017-3] and to FAPESP – São Paulo Research Foundation [Process 2019/19429-3] for financial support.

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