



**CÁTEDRA UNESCO: ÁGUA, MULHERES E
DESENVOLVIMENTO – UFOP – 26/02/2006**

REPORT OF THE ACTIVITIES

2018-2020

This report summarizes our teaching, research and extension activities; our publications, participation in congresses, the numbers of ALEMUR, the changes that have taken place in the administration of the Chair, and our plans for the future.

UNESCO CHAIR :

**water, women and
development**

SUMMARY

1. Basic information on the Chair	6
2. List the activities undertaken in the framework of IHP in the period January 2019 – December 2019 (identify the IHP themes to which the activities contribute, specify the number of male and female beneficiaries and age group i.e. 15-24 and 24 and over).	7
2.1. THE GEOCONSERVATION AS A TOOL TO SUPPORT TOURISM IN THE CAPANEMA'S RIDGE – MG	7
2.2. WOMEN IN GEOSCIENCES	8
2.3. INVENTORY OF MAJOR AND TRACE ELEMENTS OF DRINKING WATER OF OURO PRETO CITY, MG	9
2.4. UFOP DAM RUPTURE CONSEQUENCES STUDIES NETWORK	10
2.5. INTRODUCTORY SHORT-COURSE – THE USE OF SURFER® PROGRAM APPLIED TO HYDROGEOLOGY	11
2.6. BASIC SANITATION IN AREAS OF SOCIAL INTEREST IN THE OURO PRETO CITY	12
2.7. PERMANENT SUSTAINABILITY FORUM OF HISTORICAL CITIES OF MINAS GERAIS	14
2.8. NON-STATIONARITY ANALYSIS OF INTENSE RAINS IN BELO HORIZONTE METROPOLITAN REGION: Impacts and measures of urban resilience	27
2.9. FEASIBILITY ANALYSIS OF IMPLEMENTATION OF INDIVIDUAL WATER MEASUREMENT SYSTEMS IN BUILDINGS IN OURO PRETO - MG	28
2.10. COMPARISON OF SIX METHODS OF DETERMINING THE LONGITUDINAL DISPERSION COEFFICIENT: CASE STUDY AREIAL STREAM	29
2.11. HYDROLOGICAL MODELING FOR RAIN SIMULATION IN THE RIO DAS VELHAS WATERSHED AS A SUBSIDY FOR THE CPRM CRITICAL EVENT ALERT SYSTEM	29
2.12. DIAGNOSIS OF WATER DISTRIBUTION NETWORKS IN CACHOEIRA DO CAMPO AND PROPOSING IMPROVEMENTS	30
2.13. HYDROLOGICAL MODELING FOR DIAGNOSTICS OF FLOOD AREAS: CASE STUDY OF CARIOCA SUB-BASIN IN ITABIRITO - MG	31
2.14. MONITORING OF THE PARAMETERS OF THE WATER QUALITY INDEX AND THE TROPHIC STATE INDEX OF LAGOA DO GAMBÁ, OURO PRETO - MG	31
2.15. STUDY FOR THE IMPLEMENTATION OF RAINWATER COLLECTING SYSTEM FOR THE PUBLIC SCHOOL PEIXOTO GOMIDE IN ITAPETININGA - SP	32
2.16. SOLID WASTE MANAGEMENT IN TOURIST CITIES, FOCUSING ON OURO PRETO, MINAS GERAIS	34
2.16.1 GENDER RELATIONS IN WATER MANAGEMENT DECISION-MAKING IN OURO PRETO	34
2.16.2 CONVIVER: VALUING AND EMPOWERING PEOPLE FOR LIVING TOURISM	35
2.17. GEOCHEMISTRY AND STRATIGRAFIC ANALYSIS OF CUTBANKS SEDIMENTS IN GUALAXO DO NORTE RIVER– MG	37
2.18. MEDICAL GEOLOGY AND SOCIO-ENVIRONMENTAL DIAGNOSIS OF THE CITY OF BARRA LONGA, MG, BRAZIL	38
2.19. Vídeo INVENTORY OF MAJOR AND TRACE ELEMENTS OF DRINKING WATER OF OURO PRETO CITY, MG	39
2.20. UFOP DAM RUPTURE CONSEQUENCES STUDIES NETWORK	40
2.21. WEBINARS: EXPERIENCE OF WOMEN FROM GEOSCIENCES IN THE JOB MARKET	41
2.22. PRÓ-MANANCIAS PROGRAM: PARTICIPATORY WATER MONITORING IN THE RIBEIRA DO PRATA BASIN	43
	44

2.23. STUDY OF SEDIMENTS BY ANTÔNIO PEREIRA AND SANTO ANTÔNIO DO SALTO IN AN ATTEMPT TO CORRELATE METALS PRESENT IN THE SAMPLES WITH THE FOGO SELVAGEM DISEASE	44
2.24. HANDLING AND PRODUCTION OF HYGIENE PRODUCTS	45
2.25. NON-STATIONARITY ANALYSIS OF INTENSE RAINS IN BELO HORIZONTE METROPOLITAN REGION: Impacts and measures of urban resilience	46
2.26. EVALUATION OF FLOODING PRECIPITATIONS IN SMALL BASINS: A CASE STUDY FOR RAPOSOS AND RIO ACIMA (MG)	47
2.27. RESTORATION OF URBAN RIVERS AS A STRATEGY FOR A MORE SUSTAINABLE CITY: A CASE STUDY FOR THE RIO DO CARMO, IN OURO PRETO - MG	48
2.28. PARTICIPATORY PLANNING AND MANAGEMENT OF WATER RESOURCES IN URBAN CENTERS: VISION OF THE RIO DO CARMO RIVER BASIN SOCIETY (OURO PRETO - MG)	50
2.29. SIZING OF RESERVOIRS FOR RAINWATER STORAGE AND HYDROLOGICAL MODELING OF SCENARIOS. CASE STUDY IN THE BARREIRO REGION - BELO HORIZONTE / MG	51
2.30. SUSTAINABLE SANITATION	52
3. Collaboration and linkages (specify activities which involve other UNESCO chairs and/or members of the water family)	56
4. Communication/Knowledge Sharing (e.g. website/ platforms created or newsletters)	65
Publications	66
5. Institutional changes/updates	72
6. Please provide examples of the Center / Chair's Main achievement(s)/success stories/best practices	74
7. Future activities that will contribute directly to IHP and/or to WWAP Activities in the framework of the SDGs (identify the SDG (target if possible) for which each activity contributes).	78

LIST OF FIGURES

Figure 1: Litologic map, satellite image with research points and waterfall to geoconservation and geotourism.	8
Figure 2: Graphics showing some results obtained in this project.	9
Figure 3: Water sample in reservoir and dissemination of water quality results to the Community.	10
Figure 4: UFOP Network Event about consequences of tailings in river.	11
Figure 5: Maps made during the mini course.	12
Figure 6: Booklet produced by the rainwater harvesting workshop - use and operation of the system installed at the community associations.	13
Figure 7: Permanent sustainability forum of historical cities of Minas Gerais: Edition Ouro Preto on July 11 and 12 the 2019 - Programming and photos of activities.	16
Figure 8: Permanent sustainability forum of historical cities of Minas Gerais: Edition Brumadinho pn 24 and 25 October the 2019 - Programming and photos of activities.	18
Figure 9: Indicator monitoring panel of historic cities in the state of Minas Gerais (Power BI Program). Access this link	21
Figure 10: Forum participation in the Global Week for the sake of the SDGs (Global Week to # ACT4SDGs) - Presentation of the Manifesto Letter (5th edition).	21
Figure 11: Photo gallery and datas - 5th edition - Paracatu 2020. Access this link	26
Figure 12: Visit at pluviometric station "Caixa de Areia".	28
Figure 13: Published in the XXIII Brazilian Symposium on Water Resources.	32
Figure 14: Published in the XXIII Brazilian Symposium on Water Resources.	33
Figure 15: Published in the Encontro de Saberes-Ouro Preto, MG.	35
Figure 16: Participant assessment of the activity (2019).	36
Figure 17: Project Data, 2019.	36
Figure 18: A profile of cutbank sediments showing the clayey top and the gualaxo do Norte river with loose blocks of the cutbank stabilization.	37
Figure 19: Total manganese result, since the dam burst until the second quarter of 2019, obtained in the special monitoring by IGAM and its limit value, established by CONAMA (2005).	39
Figure 20: Webinar about consequences of tailings in river.	40
Figure 21: Webinars and lives promotion folders.	42
Figure 22: Maps with delimitation of the erosions of the studied basin and land use and occupation and photos of the partners in the field.	44
Figure 23: Contents of posts made on hygiene.	46
Figure 24: Field visit on the Carmo River - Ouro Preto (MG).	50
Figure 25: Booklet - Practical tips on sustainable sanitation for the pandemic period and beyond.	54
Figure 26: Folder - Practical tips on sustainable sanitation for the pandemic period and beyond. Access the Group's website.	55
Figure 27: Presentation of work at the Knowledge Meeting - Extension Seminar 2020 at UFOP - Access the Group's website.	56
Figure 28: Webinar - Presentation panel of the booklet "Practical tips on sustainable sanitation for the pandemic period and beyond"- Access the Group's website.	56
Figure 29: Lecture- Mineiro Institute of Water Management.	57
Figure 30: Lecture Women's role in water resources management.	58
Figure 31: Participation in UNESCO International Water Conference	58
Figure 32: UNESCO International Water Conference.	58
Figure 33: Lecture Water and Gender.	59
Figure 34: Participation in Waterlat – Chile.	59
Figure 35: Participation in Waterlat – Chile.	60
Figure 36: Participation in ENCOB – Foz do Iguaçu - Brazil.	60
Figure 37: Lecture in ENCOB – Foz do Iguaçu - Brazil	61
Figure 38: Informal meeting IHP.	62
Figure 39: Webinar gender and climate in America Latin America and the Caribbean	63
Figure 40: Folder Craft soap manufacturing course	64
Figure 41: Certificate ONU HABITAT	64
Figure 42: Manifest Letter	65
Figure 43: Magazine ok Nucat.	66
Figure 44: Operating structure of the Chair	73

Figure 45: Chair Members Meeting with Municipal Water Agency	74
Figure 46: Coordination of New Line of research – Solid Residues and Gender with Lais Pacheco (Master Student) and Kerley Alves (co- Sponsor).....	76
Figure 47: Number of men and women in training and events.....	76
Figure 48: Handmade Soap Course in America Latin America and the Caribbean support HIP- Lac	77
Figure 49: Number of men and women in handmade Soap Course.	78

Format for Biennial Reports by UNESCO's Water-related Chairs on activities related to the IHP in the period (June 2018– Maio 2019)

1. Basic information on the Chair

1. Basic information

Full Name of the Center / Chair		Chair Water, Women and Development
Name of the Center Director / Chair holder		Adivane Terezinha Costa
any other contacts (other focal points/deputy director / co-chair, etc.)		Vera de Miranda Guarda
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Mailing Address		nucat@ufop.edu.br ; adivane@ufop.edu.br
Geographic scope ^{1*}		<input type="checkbox"/> global <input checked="" type="checkbox"/> regional
Specify which Region(s) (if applicable)		Brazil and América Latina
Year of establishment		2006
Year of renewal		2020
Th e m e s O f a c t i v i t i e s d u r i n g r e p o r t i n g p e r i o d	Focal Areas ^{2*}	<input checked="" type="checkbox"/> groundwater <input checked="" type="checkbox"/> urban water management <input checked="" type="checkbox"/> rural water management <input type="checkbox"/> arid / semi-arid zones <input checked="" type="checkbox"/> humid tropics <input type="checkbox"/> cryosphere (snow, ice, glaciers) <input checked="" type="checkbox"/> water related disasters (drought/floods) <input checked="" type="checkbox"/> Erosion/sedimentation, and landslides <input type="checkbox"/> ecohydrology/ecosystems <input checked="" type="checkbox"/> water law and policy <input checked="" type="checkbox"/> social/cultural/gender dimension of water/youth <input type="checkbox"/> transboundary river basins/ aquifers <input type="checkbox"/> mathematical modelling <input type="checkbox"/> hydroinformatics <input checked="" type="checkbox"/> remote sensing/GIS <input type="checkbox"/> IWRM <input type="checkbox"/> Watershed processes/management <input type="checkbox"/> global and change and impact assessment <input type="checkbox"/> mathematical modelling <input checked="" type="checkbox"/> water education <input checked="" type="checkbox"/> water quality <input type="checkbox"/> nano-technology <input checked="" type="checkbox"/> waste water management/re-use <input type="checkbox"/> water/energy/food nexus <input type="checkbox"/> water systems and infrastructure <input type="checkbox"/> Water Diplomacy <input type="checkbox"/> Climate Change <input type="checkbox"/> other: (please specify) _____

^{1*} check on appropriate box

^{2*} check all that apply

	Scope of Activities ^{3*}	<input checked="" type="checkbox"/> vocational training <input checked="" type="checkbox"/> postgraduate education <input checked="" type="checkbox"/> continuing education <input checked="" type="checkbox"/> public outreach <input checked="" type="checkbox"/> research <input type="checkbox"/> institutional capacity-building <input checked="" type="checkbox"/> advising/ consulting <input type="checkbox"/> software development <input type="checkbox"/> data-sets/data-bases development <input checked="" type="checkbox"/> Knowledge/sharing <input checked="" type="checkbox"/> Policy Advice/Support <input checked="" type="checkbox"/> Publication and documentation <input type="checkbox"/> other: (please specify) _____
Existing networks /cooperation/partnerships ⁴		Yes, Unesco Brazil, UniTwin
Please state any other Institutional affiliations of the Center Director / chairholder		
Number of staff and types of staff		total number of staff (full-time, or equivalent) : 12 _____ number of staff who are water experts: ___7___ number of visiting scientists and postgraduate students: ___4___
Annual budget in USD		No budget
Sources of financial support ⁵		UFOP

2. List the activities undertaken in the framework of IHP in the period january 2019 – December 2019 (identify the IHP themes to which the activities contribute, specify the number of male and female beneficiaries and age group i.e. 15-24 and 24 and over).

2.1. THE GEOCONSERVATION AS A TOOL TO SUPPORT TOURISM IN THE CAPANEMA'S RIDGE – MG

Coordination of Prof. Dr. Adivane Terezinha Costa – Department of Geology– Mine Scholl.
Themes: water education, rural water management, remote sensing/ GIS;

The Geological Engineering Tutorial Education Program (PET) with students (4 male and 6 female) developed the present project for inventorying and cataloging six geosites with beautiful

³

⁴ please indicate international networks, consortiums or projects that the center/chair/ network of Centers/Chairs is part of, or any other close links that the chair has with international organizations or programmes, which are not already mentioned above

⁵ please specify sources of main budgetary and extra budgetary funds to implement projects

landscapes, outcrops and waterfalls. It was based on geoconservation concepts and practices, which worked along with the tourism already established in the region.

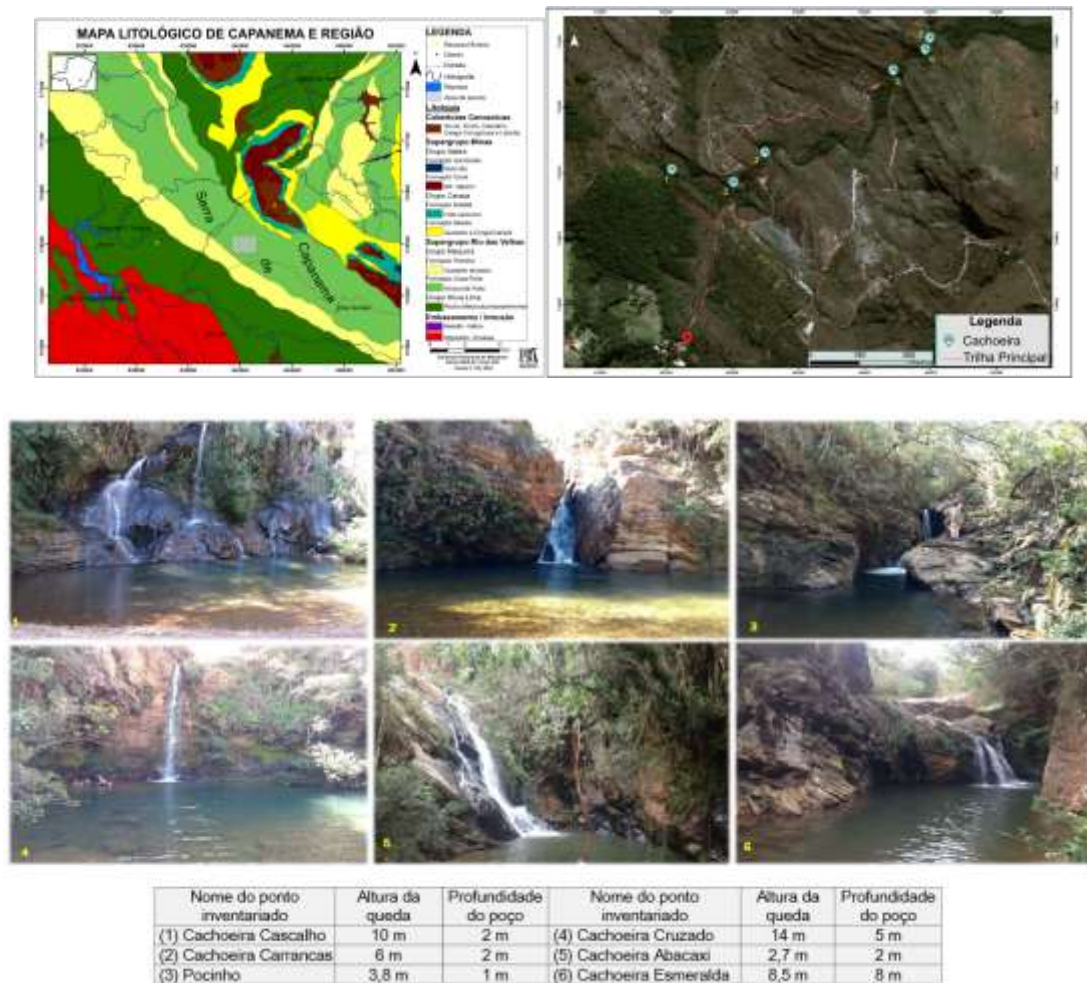


Figure 1: Litologic map, satellite image with research points and waterfall to geoconservation and geotourism.

2.2. WOMEN IN GEOSCIENCES

Coordination of Prof. Dr. Adivane Terezinha Costa – Department of Geology– Mine Scholl.
Themes: gender inequality, women. It's a project supported by FNDE/MEC and developed by 1 female (Juliana Fernandes Couto).

The female presence in higher education institutions has increased significantly in Brazil. One of the difficulties encountered by women in Geological Engineering, a profession historically dominated by men, is their own insertion in the labor market. In this context, this study aims to contribute to the discussion about gender relations, focusing on the presence of women in higher educational institutions and their relative portion as part of the workforce in the field of Geological Engineering. Initially, an online form was produced and distributed to female geological engineers graduated, from the Universidade Federal de Ouro Preto, in past ten years.

The data obtained in this study revealed a great inequality that still exists in the field. Such unfairness starts at University, where 54.3% of the interviewees reported that they have suffered discrimination during the graduation period. Subsequently, women face a second challenge, the obstacles of joining the job market. Almost 90% of the women believe that the difficulty in this area is linked to gender issues, which can begin as early as job interviews which very often incorporates discriminatory questions. Of the total interviewed, 28.6% of women said that they had suffered sexual harassment in the workplace and 54.3% had suffered bullying, and the few cases which were reported were neglected. As a result, it is evident the gender inequality among Geological Engineers. Thus, the discussion on this subject within the University becomes more essential, proving the necessity to take actions for the awareness and appreciation of the female participation in the field.

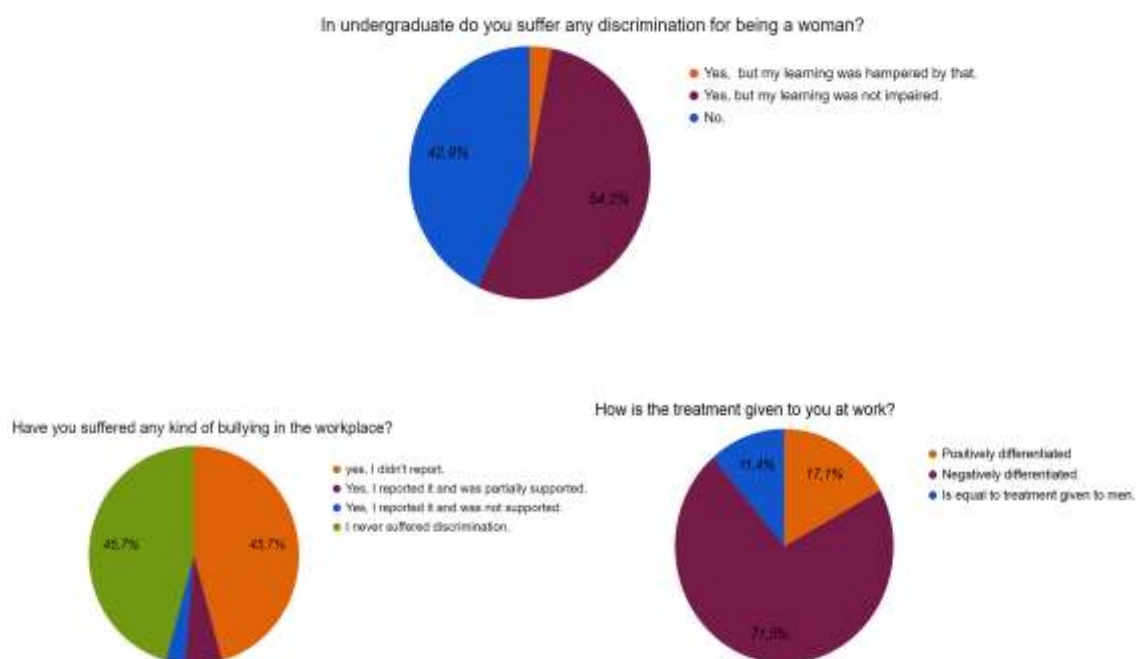


Figure 2: Graphics showing some results obtained in this project.

2.3. INVENTORY OF MAJOR AND TRACE ELEMENTS OF DRINKING WATER OF OURO PRETO CITY, MG

Coordination of Prof. Dr. Adivane Terezinha Costa – Department of Geology– Mine Scholl. Themes: water education, water quality. data-bases development It's a project supported by FNDE/MEC and developed by 4 female and 3 male.

The partnership with SEMAE-OP, has the objective of monitoring the quality of the water used for public supply of the headquarters and districts of the municipality of Ouro Preto. Thus, chemical analysis of larger elements and trace and physical-chemical parameters were performed in 13 samples collected in water catchments of the municipality. These samples were subjected

to ICP-OES and ICP-MS geochemical analyzes while the physicochemical parameters were measured using an in situ multiparameter. The results obtained were compared with the limits published by the Ministry of Health (MS) Ordinance 2914 of 2011 for potability standards. MG. Of the samples collected, two exceed the limit of $200 \mu\text{g} / \text{L}$ established by the MS ordinance for aluminum. Al is present in waters all over the planet, but currently the presence of residual aluminum in drinking water has been associated with neurological diseases such as Alzheimer's and in the area seems to be related to aluminum hydroxide used in flocculation treatment. . Another element that presented high values and exceeded the limits of the ordinance was the As, presenting concentration up to two times higher than the limit imposed by the MS of $10 \mu\text{g} / \text{L}$ marking in 3 samples.



Figure 3: Water sample in reservoir and dissemination of water quality results to the Community.

2.4. UFOP DAM RUPTURE CONSEQUENCES STUDIES NETWORK

Coordination of Prof. Dr. Adivane Terezinha Costa – Department of Geology– Mine Scholl. Themes: data-bases development. It's a project supported by FNDE/MEC and PROEX/UFOP and developed by 3 female and 1 male.

The project aims to map all studies associated with the mining dam rupture within the Federal University of Ouro Preto, channeling them into a single database on a digital platform, accessible to all, facilitating communication between coordinators of actions in UFOP and other national and international institutions in the aspects of teaching, research and extension. In addition to the promotion of open events and debates, with the participation of internal and external entities.



Figure 4: UFOP Network Event about consequences of tailings in river.

2.5. INTRODUCTORY SHORT-COURSE – THE USE OF SURFER® PROGRAM APPLIED TO HYDROGEOLOGY

Coordination of Prof. Dr. Adivane Terezinha Costa and Paulo Galvão – Department of Geology– Mine Scholl. Themes hydrogeology, water education. It's a project supported by FNDE/MEC and developed by 2 female and 2 male.

The use of geotechnologies is becoming more present in academic and professional spheres. In this sense, PET - Geological Engineering, in partnership with HidroUFOP and Professor Paulo Galvão, teaches the introductory short-course – The Use of SURFER® program applied to Hydrogeology. The short-course is focused on the mapping of potentiometric surfaces and contamination plumes, as well as the generation of 3D models facilitating the visualization of maps, communicating with other software such as ArcGIS and CorelDRAW.

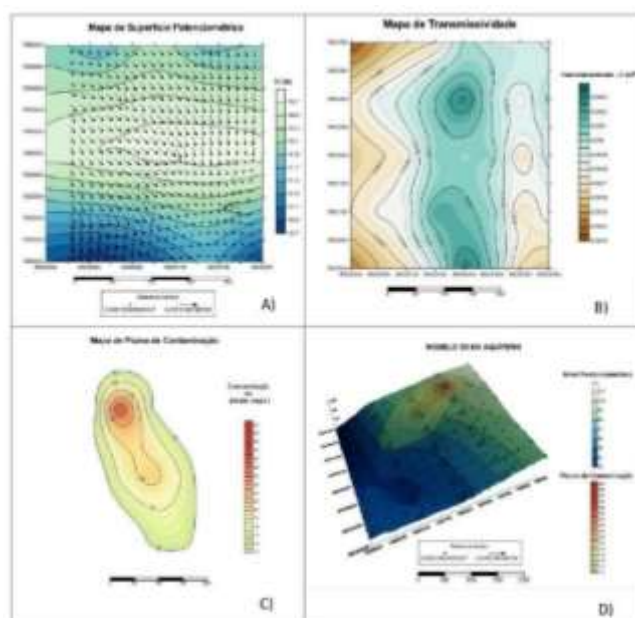


Figure 5: Maps made during the mini course.

2.6. BASIC SANITATION IN AREAS OF SOCIAL INTEREST IN THE OURO PRETO CITY

Under coordination of Professor Dr. Paulo de Castro Vieira (VIEIRA, P.C.) - Department of Urban Engineering.

This project has been continuously developed since 2017, with the participation of students (4 female and 1 male) of Architecture and Urbanism and Urban, Civil and Environmental Engineering courses, where a teaching, research and extension group called Sustainable Sanitation.

In the scope of the research, the objective is to evaluate basic sanitation conditions based on primary and secondary data obtained from service indicators, infrastructure elements and the perception of residents of areas of social interest. (ASI) This year 2019 the research was developed in district neighborhood, where is located two areas of social interest characterized by the lack of adequate urbanization, one of them recognized in municipal law and the other still in irregular conditions. These localities have approximately 150 inhabitants.

Within the scope of university extension, this project aims to carry out training activities in environmental and health education with populations located in areas of social interest addressed, counting mainly as community leaders for the formation of multiplier agents. During the year 2019, more than 20 workshops and meetings were held in the São Cristóvão district (approximately 50 inhabitants, community leaders and residents of ASI), with updates on water supply, capture and utilization of rainwater installations, with the implementation of facilities at the headquarters of the public association for the use of models for other community stakeholders. The published works are presented in item 3. The results and analyzes reproduced

so far, presented in the format of articles and published works can be accessed in the digital library, research and extension group on sustainable sanitation.

Perguntas frequentes:

- 1 - Quais os propósitos de utilizar água de chuva?**
O sistema tem a finalidade de realizar o aproveitamento de água da chuva, reduzir o consumo de água potável e contribuir para a redução do risco de enchentes e alagamentos.
- 2 - Como o sistema foi planejado e construído?**
O desenvolvimento do projeto teve como referência recomendações técnicas, as etapas de construção foram realizadas junto com a comunidade local, por meio de oficinas na sede da Associação Comunitária de Moradores do Bairro São Cristóvão.
- 3 - Quais os componentes do sistema atual?**
As águas da chuva captada no (1) telhado são conduzidas junto a (2) calha condutora até o (3) filtro de autolimpeza, seguido de (4) tubo de primeiro descarte, passa pelo processo de (5) cloração, e tem auxílio do (6) tubo redutor de turbulência que se encontra dentro da (7) caixa de armazenamento de água pluvial, (8) o sistema de distribuição permite que a água captada e reservada seja utilizada para fins não potáveis.

Realização



Grupo de Saneamento Sustentável Associação Comunitária de Moradores do Bairro São Cristóvão

Apoio institucional



PROEX UFOP deUrb

MANUAL DE USO E OPERAÇÃO

SISTEMA DE CAPTAÇÃO E APROVEITAMENTO DE ÁGUAS PLUVIAIS



PROJETO DE EXTENSÃO UNIVERSITÁRIA SOCIAL
EDUCAÇÃO SANITÁRIA SUSTENTÁVEL EM ÁREA DE INTERESSE SOCIAL DO MUNICÍPIO DE OURO PRETO / 2019
saneamentosustentavelufop@gmail.com



Confecção do filtro artesanal autolimpante, na sede da Associação Comunitária do Bairro São Cristóvão

ETAPA 1 - Captação:

O telhado e a calha realizam o processo de captação e transporte da água da chuva, sempre que necessário realiza a limpeza e desobstrução dos componentes.



ETAPA 4 - Cloração:

Realiza a desinfecção da água, por meio de um clorador, deve ser mantido com pastilha de cloro e o controle de dosagem deve ser realizado através da regulagem dos registros. O tempo médio de reposição da pastilha é de 3 meses.



ETAPA 7 - Disponibilização nas instalações sanitárias:

O sistema de aproveitamento de águas pluviais, não potável, é utilizado na descarga dos sanitários e lavagem de jardins, na ausência de água pluvial, que pode ser verificada através da mangueira de nível, abrir o registro de água potável e fechar o registro de água de chuva para utilização nos sanitários.



ETAPA 2 - Filtração:

Essa etapa conta com um filtro de autolimpeza, mas fique atento em caso de obstrução por folhas e outros sólidos.

ETAPA 5 - Reservação da água:

Conta com calhas de água pluvial para armazenamento, que contém água não potável, deve ser esvaziada e limpa, com água, sem o uso de sabão, utilize água sanitária na proporção 1 litro para 1000 litros de água, descarte a água residual após limpeza. Não há mistura entre as águas potável e pluvial nas calhas de água.



ETAPA 3 - Descarte da primeira água:

O tubo de primeiro descarte deve ser esvaziado sempre após a ocorrência de uma chuva, reter folhas e sólidos maiores, além da poluição atmosférica.



ETAPA 6 - Sistema de distribuição:

Composto por tubos, conexões e registros, esses e outros componentes do sistema devem ser verificados quanto à ocorrência de vazamentos, corrosão e funcionamento, correto sempre que observado alguma variação do sistema inicial.



RESUMO DAS ATIVIDADES DE MANUTENÇÃO

COMPONENTES	FREQUÊNCIA DE MANUTENÇÃO
Telhado	quando necessário
Calhas e condutores	quando necessário
Filtro	autolimpante
Tubo de descarte	após cada chuva
Clorador	min. 3 meses
Reservatório	anual

Este guia não dispensa a consulta ao relatório completo de uso e operação do sistema de captação e aproveitamento de águas pluviais, intitulado "Relatório de uso e operação do sistema de aproveitamento de águas pluviais" e disponível na Associação Comunitária de Moradores do Bairro São Cristóvão, Ouro Preto - MG.

Figure 6: Booklet produced by the rainwater harvesting workshop - use and operation of the system installed at the community associations.

2.7. PERMANENT SUSTAINABILITY FORUM OF HISTORICAL CITIES OF MINAS GERAIS

Under coordination of Professor Dr. Paulo de Castro Vieira (VIEIRA, P.C.) - Department of Urban Engineering

This project aims to contribute to the creation and strengthening of public policies for sustainable development and resilience of the Historical Cities of Minas Gerais, based on the precepts addressed in the UN Agenda 2030 (Sustainable Development Goals). For this, a semester (for two days) is held with representatives of 30 historic municipalities of Minas Gerais and other public, private and non-public entities. In each edition, panels are held debates, lectures, short courses, manifest letters and research on the respect of the theme addressed. In 2019, two editions were held, one in the city of Ouro Preto on July 11 and 12 (Sustainable development in the urban nucleus), with 270 participations, and another edition in the city of Brumadinho on the 24 and 25 October (Innovation and Inclusion), with approximately 150 participations in various activities. An edition of the forum held in Brumadinho participated in the UN-Habitat 2019 Urban Circuit. The published works are presented in item 3. To learn more about the Forum, access the digital library containing articles, lectures, photos, manifest letters and other materials used in the publications.



FÓRUM PERMANENTE DE SUSTENTABILIDADE DAS CIDADES HISTÓRICAS DE MINAS GERAIS

"Cidades históricas e seus entornos: a sustentabilidade e a resiliência vão além de seus núcleos urbanos"

PROGRAMAÇÃO

11 de julho de 2019 / Centro de Artes e Convenções da UFOP

9h às 9h45 - Pronunciamentos de abertura / Participação: UFOP, ACHMG, Autoridades locais e estaduais e ONU-Habitat.

9h50 às 10h20 - Palestra introdutória: O panorama do desenvolvimento sustentável das Cidades Históricas de MG / UFOP

10h20 às 12h20 - Paineis Mineração: A relação com entorno e os impactos para a sustentabilidade e a resiliência das Cidades Históricas de MG / Participação: UFOP, Promotoria Estadual de Defesa do Patrimônio Cultural e Turístico de Minas Gerais, Prefeitura de Congonhas e UFMG

13h30 às 15h30 - Paineis Expansão Urbana: O crescimento urbano e os impactos para a sustentabilidade e a resiliência das cidades históricas de MG / Participação: UFOP, Prefeitura de Santa Bárbara, IPHAN, IEF

15h30 às 17h30 - Paineis Atividades Rurais: A relação e a importância para a sustentabilidade e a resiliência das Cidades Históricas de MG / Participação: UFOP, EMATER MG, USP e Prefeitura das Cidades Históricas

12 de julho de 2019 / Escola de Minas da UFOP (Praça Tiradentes)

8h30 às 17h - Minicursos :

- (1) Aspectos Jurídicos na Proteção do Patrimônio Cultural;
- (2) Fundamentos e metodologias da prática arqueológica em campo;
- (3) Turismo Rural;
- (4) teorias e práticas de conservação e restauro e o case do município de Paracatu;
- (5) Segurança contra incêndios em áreas e edificações com elementos do patrimônio histórico;
- (6) Gestão de Riscos Urbanos;
- (7) Instrumentos para prevenção e controle de cheias urbanas;
- (8) Coberturas Verdes;
- (9) Uso de viga de aço de alto desempenho e sustentável em arquiteturas históricas

Visita técnica guiada: A mineração do século XVIII na Serra de Ouro Preto, seus remanescentes e as interações sócio-ambientais-arqueológicas

11 E 12 / JULHO | INSCRIÇÕES GRATUITAS | VAGAS LIMITADAS

e-mail: forumsustentabilidade@ufop.edu.br | inscrições: encurtador.com.br/gwzDX



**Fórum Permanente de Sustentabilidade
das Cidades Históricas
de Minas Gerais**

"Cidades históricas e seus entornos: a sustentabilidade e a resiliência vão além de seus núcleos urbanos"

Programação da Edição 2019-I | Festival de Inverno Ouro Preto 2019

Fotos da abertura, dos painéis e das palestras - 11 de julho



**Fórum Permanente de Sustentabilidade
das Cidades Históricas
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"Cidades históricas e seus entornos: a sustentabilidade e a resiliência vão além de seus núcleos urbanos"

Programação da Edição 2019-I | Festival de Inverno Ouro Preto 2019

Fotos dos minicursos e das oficinas - 12 de julho



Figure 7: Permanent sustainability forum of historical cities of Minas Gerais: Edition Ouro Preto on July 11 and 12 the 2019 - Programming and photos of activities.

Cidades históricas sustentáveis e resilientes por meio da inovação e inclusão
Edição Brumadinho 2019.2

Edição Brumadinho 2019 2

Solo Abertura

Prefeitura de Brumadinho
Associação das Cidades
Históricas - Pró-Retirada do
Extensão da UOP; outros
delegados ambientais

14h - 17h30 Sessão Cases de Sucesso: experiências de entidades e órgãos públicos das Cidades Históricas.

10h Apresentação da Carta
Manifesto da edição Ouro
Preto 2019-1
Isac Costa Arrado, Secretário
Municipal de Cultura e
Turismo de Paracatu

17h30 Caffè e prova

90h50 – 12h30 Painel de debate: Inovação e inclusão para o desenvolvimento sustentável e a resiliência das Cidades Históricas de Minas Gerais

Departamento Cabeças
Econômica / FOP, Tribunal
Regional do Trabalho 2ª Região
- Vaga do Trabalho de Opre
Ponto Secretária do Meio
Ambiente e Desenvolvimento
Sustentável, Banco de
Desenvolvimento de Mima
Gratuito

7. Oficina de produção audiovisual a partir de dispositivos móveis (15h30-17h30)

Ministrante: Thiago Caldeira da Silva, jornalista do laboratório audiovisual do curso de Jornalismo da UFMG.

10. Gestão de Resíduos Urbanos
(Slc50 - 17h)

Ministrantes: Dra. Roselyle Corteletti, Professora do Núcleo de Gerontologia – NUGEO da UFOP e o Sr. Charles Romualdo Murta, Eng. Geólogo da Defesa Civil de Ouro Preto.

5. Oficina de Design Sprint
(8h50 - 17h)

Ministrante: Kelson Douglas
Diretor Criativo do I Love
Poel, organizador do Startup
Weekend e líder local do
IXDA Mariana - Ouro Preto

11. Controle de qualidade da água e a relação com a saúde (5870-12470)

Ministrante: Profa. Dra,
Adriane Terzinhos Costa,
DEGED/UFOP

9. Agenda 2030 e ODS na agenda pública municipal (15h30 - 17h30)

Ministrante: José Dyon Carlos
Alves Santos, Especialista em
desenvolvimento local e ODS
pela ENAP/Brasília.
Secretário de
Desenvolvimento de Itaboraí

Café e presa (17h30)

1. Patrimônio histórico e

Ministrante Paula, Dra. M.

do Carmo Pires DETUR/UTOP

2. Turismo Rural: cenários e possibilidades em Minas Gerais (Sh50 - 12h50)

Ministrante-Prof.^a Dra.
Alexandra Nazareth de
Carvalho DETUR/UFPA

3. Turismo Ecológico (13h30
- 17h30)

Ministrante: Prof. Dr. Ricardo
Eustáquio Fonseca Filho
DETUR/UFOP

4. Turismo de base comunitária e desenvolvimento local
(13h30 - 17h30)

Ministrante: Profa. Dra. Kerley
dos Santos Alves
DETUR/UFOP

5. Agricultura familiar e preservação do patrimônio (15h50 - 17h)

Ministrante Prof. Marcelo
Leonard de Souza
DEARQ/UTOP

4i. Elaboração de projeto social (8h30 - 12h30)

Ministrante: Profa. Dra. Vera
Lúcia Guarná, Presidente do
Rotary OP

24 e 25 de outubro | Faculdade ASA de Brumadinho

Inscrições em www.ufop.br/eventos/sustentabilidade a partir de 20 de setembro

Alunos da UFOP, há vagas para o transporte de ida e volta, porém limitadas, solicite através do e-mail forumsustentabilidade@ufop.edu.br

Realização



Apoio e participação



Ángulo Institucional





Figure 8: Permanent sustainability forum of historical cities of Minas Gerais: Edition Brumadinho pn 24 and 25 October the 2019 - Programming and photos of activities.

This project has been developed since 2018 and aims to contribute to the formulation and strengthening of public policies aimed at sustainable development and the resilience of the Historic Cities of Minas Gerais, which comprise about 32 cities within the scope of the ACHMG. The way to achieve the objective in question is through debates, training and exchange of experiences on panels, manifest letters, workshops, short courses and successful cases of the

municipalities, addressing issues related to the environmental, socio-cultural and economic dimensions in the context municipal management. These activities are carried out on a voluntary and participatory basis with representatives of public bodies (municipal, student and federal), educational institutions, sectors of the private sector and organized civil society, with public participation, which makes the Forum a pluralistic environment due to the diversity of knowledge, thoughts and positions.

In this year of 2020, two editions were held (5th and 6th ed) with all activities carried out remotely over the internet. The documents of these editions are presented on the project website <https://forumsustentabilid.wixsite.com/inicio>

The 5th edition was held on the 29th of June to the 3rd of July with the theme “Municipal Planning for the sustainable development of the historic cities of Minas Gerais” with a wide program with panels of debates and mini-courses detailed in [the program poster](#). Topics such as policies for sustainable urbanism, sustainable local development were addressed. Among the topics addressed on urban planning policies, the panorama of regional conditions of basic sanitation and the new federal regulations on the subject were discussed. The Portuguese language content of this debate can be accessed on the Forum's [website](#) and [YouTube](#) channel, where it has over a thousand views.

The public participation of the 5th edition went from 2 thousand people in the live broadcasts, with the issuance of approximately 1096 certificates for representatives of different sectors (33% outside the academy), genders (66% female) and ages (35% of 25 35 years). These people participated on the internet in 131 Brazilian cities, located in 17 states, and 3 foreign countries - Uruguay, Paraguay and Spain. From Minas Gerais we had the participation of 68 cities, 26 of them being Historic Cities. These data are presented on the [5th edition wall](#) available on the [project's website](#).

The manifest letter of this edition was presented in a webinar on the YouTube channel of the Forum as part of the programming of the global week of actions for SDGs in favor of Agenda 2030 in celebration of the 75th anniversary of the United Nations (UN). The broadcast was presented in two languages, with English subtitles and real-time translations. It is estimated that 150 unique viewers watched the webinar live, with the majority of the audience being Brazilian (67.6%). Current views exceed 260 viewers. The 5th edition letter can be accessed on the [website](#) and the presentation on the Forum's [YouTube](#) channel.

The 6th edition was held in October 2020 with the theme "The objectives of sustainable development of Agenda 2030 in traditional communities". This edition had the honor of participating once again in the international circuit Urban October 2020 of UN-Habitat through the Urban Circuit 2020 of the Brazilian office of that entity.

The first activity of this edition was the holding of a panel of debates with live transmission on the [UN-Habitat channel on YouTube](#), which had as its theme the relationship of the thematic guidelines of the objectives of sustainable development with the traditional communities of the state of Minas Gerais, counted with the participation of actors from organized civil society, government agencies, prosecutors and universities. There were also: (a) three thematic workshops on Agenda 2030 with the participation of 26 representatives from city halls and “quilombola” communities (afro-descendant) in historic cities; (b) three video classes on traditional peoples and communities that are available on the [Forum channel](#) and; (c) a booklet (under development) relating the Agenda 2030 guidelines to the daily lives of “quilombola” communities (afro-descendant) and which will be available on the [Forum website](#).

It is estimated that the transmission of this panel of debates reached approximately 1,800 people, according to the statistics provided by the [UN-Habitat channel on YouTube](#). It is estimated that approximately 500 people accessed the activities developed during the sixth edition, according to the statistics of the Forum's official channel. These data are presented on the [6th edition wall](#) available on the [project's website](#).

The manifest letters of the 4th edition (Brumadinho) and the 5th edition (Municipal planning) of the Sustainability Forum of Historic Cities of Minas Gerais presented in 2020 can be accessed on the [project website](#).

To access all the content produced by the editions of the Forum in the year 2020 access the website of this extension project <https://forumsustentabilid.wixsite.com/inicio>

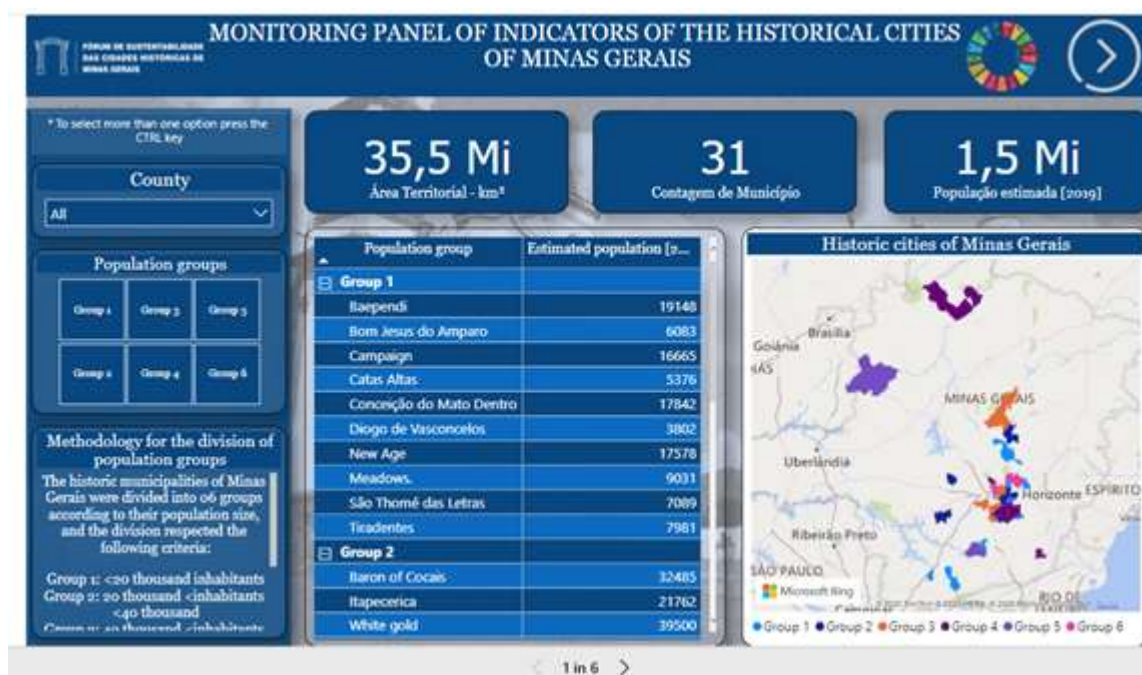


Figure 9: Indicator monitoring panel of historic cities in the state of Minas Gerais (Power BI Program). Access this link



Figure 10: Forum participation in the Global Week for the sake of the SDGs (Global Week to #ACT4SDGs) - Presentation of the Manifesto Letter (5th edition).

Access this link: [site](#) / [Webinar](#)



EVENT PROGRAM

DEBATE PANEL PROGRAMMING | JUNE 29 - JULY 1

The forum will be broadcast on our YouTube channel

June 29 - 3 pm | Opening statement of the Forum.

June 29 - 3 pm to 5 pm | Theme: "Public urban planning policies for the sustainable management of historic cities with a focus on territorial planning, urban mobility and basic sanitation". Mediator: Dr. Paulo Vieira (Prof. DEURB / UFOP and Forum coordinator) | Speakers: Dr. Sandra Maria Antunes Nogueira (Prof. DEURB / UFOP), Ma. Bárbara Abreu Matos (Prof. DEURB / UFOP) and Dr. Anibal da Fonseca Santiago (Prof. DECIV / UFOP).

June 30 - 3 pm to 5 pm | Theme: "Public policies for cultural heritage and tourism for the sustainable development of historic cities". Mediator: Dr. Marcos Eduardo Carvalho Gonçalves Knapp (Prof. DETUR and Dean of Extension UFOP) | Speakers: Ana Alcântara (Executive Secretary of ACHMG), Isabel de Paula (Unesco's Culture Coordinator - representation in Brazil) and Mário Nascimento (representative of the National Confederation of Municipalities)

July 1 - 3 pm to 5 pm | Theme: "Public labor, employment and income policies for the sustainable development of historic cities". Mediator: Dr. Carolina Machado Soraia de Albuquerque Maranhão (Prof. ICSA / UFOP) | Speakers: Dr. Graça Maria Borges de Freitas (Labor Judge of the Regional Labor Court 3rd Region - Labor Court of Ouro Preto), Dr. Alair Ferreira de Freitas (Prof. Department of Rural Economy at UFV) and Isadora Iannini Cota Dutra (Personnel Supervisor of the startup Stilingue Inteligência Artificial).

PARACATU CITY SUCCESS CASES SESSION | JULY 2

July 2 - 3 pm to 5 pm | Theme: "Projects developed by the public initiative in the socio-cultural, economic and environmental areas in the municipality of Paracatu". Mediator: Angelica Vasconcelos Souto Silva (Municipal Secretary of Culture and Tourism of Paracatu)

COURSES | JUNE 29 TO JULY 3

Digital platforms will be used to make materials available (Google Drive) and to hold discussion forums (Google Meet)

Contemporary Municipal Master Plan - Planning in Times of Paradigm Change | Hours: 6 h | Minister: Cristiano Ottoni Carvalho (Prof. DEURB / UFOP).

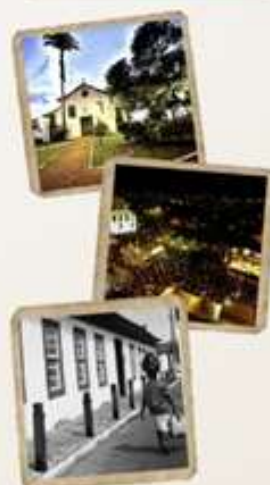
Introduction to urban mobility plans: a focus on displacement of people | Hours: 6 h | Ministers: Bárbara Abreu Matos (Prof. DEURB / UFOP) and Daniela Antunes Lessa (Prof. DECIV / UFOP)

Tourism, Heritage and sustainable development | Hours: 6 h | Minister: Maria do Carmo Pires (Prof. DETUR / UFOP).

Urban Senses: Others targeted | Hours: 6 h | Ministers: Gabriela de Lima Gomes (Prof. a of DEMUL and Deputy Dean of Extension of UFOP) and Ana Amaral Nunes Pereira (IPHAN).

2030 Agenda for Sustainable City Planning | Hours: 6 h | Minister: Paulo de Castro Vieira (Prof. DEURB / UFOP and coordinator of the Forum).

The history of mining in Vila Rica de Ouro Preto and the deconstruction of the slave's status | Hours: 6 h | Worshipers: Douglas Aparecido (Bachelor of Philosophy) and Eduardo Evangelista (Civil Engineer and Master in



photos Douglas Formanini



Realization



Support and participation





131 BRAZILIAN CITIES

17 STATES PRESENT

68 CITIES OF MINAS GERAIS

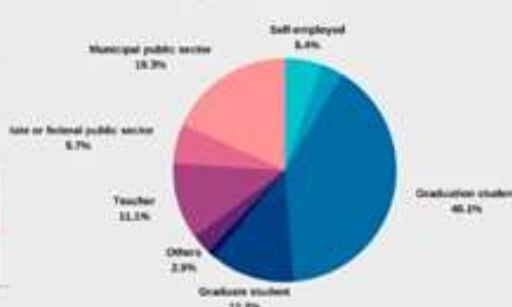
26 HISTORIC CITIES (MG)

03 FOREIGN CITIES

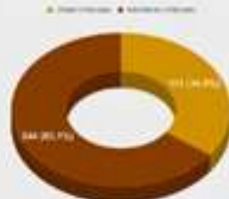
Genres by area of activity - Discussion panels
547 internet subscribers



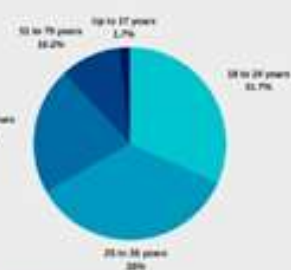
Areas of activity of participants with a certificate - Discussion panels
Cym (80%) and External (33%)



INTERNATIONAL JOURNAL OF SYSTEMS MANAGEMENT



Participant cities with certificate - Discussion panels
103 cities in 16 states (308 participants)



5ª
EDIÇÃO



FÓRUM DE SUSTENTABILIDADE DAS CIDADES HISTÓRICAS DE MINAS GERAIS

"MUNICIPAL PLANNING FOR THE SUSTAINABLE DEVELOPMENT OF THE HISTORIC CITIES OF MINAS GERAIS"

+2,000
views
on youtube

DEBATE PANELS

16 STATES, 116 BRAZILIAN CITIES AND 1 FOREIGN (PARAGUAY),
70 MINING TOWNS AND 22 HISTORIC CITIES IN MINAS GERAIS

+1,000
hours watched
on youtube



Panel of debates 1 – 06/29

Theme: "Public urban planning policies for the sustainable management of historic cities with a focus on territorial planning, urban mobility and basic sanitation". Mediator: Paula Vieira (Prof. DEUBB / UFOP and Forum coordinator) | Speakers: Sandra Maria Antunes Nogueira (Prof. DEARQ / UFOP), Bárbara Abreu Matos (Prof. DEUBB / UFOP) and Antônio da Fonseca Santiago (Prof. DECIV / UFOP).



Panel of debates 2 – 06/30

Theme: "Public policies for cultural heritage and tourism for the sustainable development of historic cities". Mediator: Marcos Eduardo Carvalho Gonçalves Krupp (Prof. DETUR and Dean of Extension UFOP) | Speakers: Ana Alcântara (Executive Secretary of ACHIMO), Isabel de Paula (UNESCO Cultural Coordinator – representation in Brazil) and Maria Nascimento (representative of the National Confederation of Municipalities).



Panel of debates 3 – 07/01

Theme: "Public policies for work, employment and income for the sustainable development of historic cities". Mediator: Carolina Maranhão Soares de Albuquerque Maranhão (Prof. ICISA / UFOP) | Speakers: Dr. Graça Maria Borges de Freitas (Labor Judge of the Regional Labor Court 3rd Region – Ouro Preto Labor Court), Alair Ferreira de Freitas (Prof. Department of Rural Economy at UFV) and Isadora Iavarini Costa Dutra (Supervisor of the Stilingue Artificial Intelligence startup).



SUCCESS CASES SESSION



Success Cases Session – 07/01

Projects developed by the public initiative in the socio-cultural, economic and environmental areas in the municipality of Paracatu. Mediator: Angélica Vasconcelos Souto Silva (Municipal Secretary of Culture and Tourism of Paracatu).



5ª
EDIÇÃO



**FÓRUM DE SUSTENTABILIDADE
DAS CIDADES HISTÓRICAS DE
MINAS GERAIS**

"MUNICIPAL PLANNING FOR THE SUSTAINABLE DEVELOPMENT OF THE HISTORIC CITIES OF MINAS GERAIS"

SHORT COURSES

115 PARTICIPANTS, 9 STATES AND 38 BRAZILIAN CITIES



**Short course 1 | Master plan
Contemporary Municipal**
Minister: Dr. Christiana
Otttoni Carvalho



**Short course 2 | Introduction to
urban mobility plans**
Ministers: Ma. Bárbara Abreu
Matos e Dra. Daniela Antunes Lessa



**Short course 3 | Tourism, Patrimônio
and sustainable development**
Minister: Dra. Maria do
Carmo Pires



**Short course 4 | Urban Directions:
Other targeted**
Ministers: Ma. Ana Amaral Nunes
Pereira e Dra. Gabriela de Lima Gomes



**Short course 5 | 2030 Agenda for the
sustainable city planning**
Minister: Dr. Paulo de Castro Vieira



**Short course 6 | Mining history
in Vila Rica de Ouro Preto ...**
Ministers: Douglas Aparecido e
Ma. Eduardo Evangelista

**Access all materials from
short courses scanning the QR Code**

64,3%
from the academic world

27,0%
of public sectors

36,5%
of participation

SCAN AND ACCESS
BY YOUR MOBILE



Cloud of participating cities



MG CITIES

GREATER PERCENTAGE OF PRESENCE

Ouro Preto
35,65%

Belo Horizonte
7,83%

Mariana
6,69%

Viçosa
5,22%

Paracatu
3,48%



Figure 11: Photo gallery and datas - 5th edition - Paracatu 2020. Access this link

2.8. NON-STATIONARITY ANALYSIS OF INTENSE RAINS IN BELO HORIZONTE METROPOLITAN REGION: *Impacts and measures of urban resilience*

Under coordination of Professor Dra. Aline de Araújo Nunes (NUNES, A.A.) - Department of Urban Engineering

This project has been developed since August 2019, with the participation of 3 students (2 female and 1 male) of Environmental Engineering course, 2 Professors (Prof. Bárbara Mendanha and Prof. Aline de Araújo Nunes - Department of Urban Engineering) and 1 researcher of CPRM - Geological Survey of Brazil (Dr. Eber José de Andrade Pinto). It's a project supported by CNPQ.

Extreme weather events have emerged as one of the main manifestations of climate change, and the adaptation and minimization of inherent impacts involves studying the magnitude and frequency of their occurrence. In this context, this research aims to contribute to the evaluation of changes in the rainfall regime of Belo Horizonte Metropolitan Region, specifically identifying and modeling trends in intense precipitation events in the region, characterized by sub-daily rainfall records, since there is growing concern about a potential increase in the occurrence of these events in the region. In view of the research objectives and taking RMBH as a case study, the work will be developed in four distinct and complementary stages. The preliminary stage corresponds to a consistent literature review, which will be extended during all stages of the research. Following, the first stage will present as objective the analysis of secondary rainfall in the RMBH. Initially, the data consistency analysis will be performed in order to select the maximum rainfall height, per hydrological year, associated with relevant durations for urban drainage (less than 24 hours), so that, later, the trends related to this data. Following (second step), in view of any trends detected in the sub-daily data, a new Intensity-Duration-Frequency (IDF) curve will be proposed. In the third and last stage, the implementation of Compensatory Techniques in Urban Drainage will be proposed, seeking benefits related to runoff control, in view of the impacts resulting from the alteration of the intense rains equation (IDF) proposed in the previous stage. To this end, scenarios will be presented in future situations, which envision a new pattern of urban development. The expected results in this study aim to highlight the hydrological benefits that the implementation of compensatory techniques can promote in the face of a scenario of changes in heavy rainfall patterns.

Considering the project execution time, there are still no results for the specific objectives, however, preliminary and essential actions were performed for their execution, as described below:

1st action - Two visits were realized to CPRM (**Figure 9**). A fieldwork was proposed at pluviometric station "Caixa de Areia", located in the Parque das Mangabeiras, in Belo Horizonte, monitored by CPRM and the National Water Agency-ANA. Such action is justified since the information of the sub-daily precipitation will be made available by the Brazilian Geological Survey (CPRM), which is currently responsible for monitoring the National Water Agency (ANA) stations.



Figure 12: Visit at pluviometric station "Caixa de Areia".

2nd action - Digitalization of the rain charts that will be used in the research

3rd action - Considering the need for theoretical knowledge, bibliographic reviews were made available for reading. Weekly, students and the coordinator hold reflection discussion meetings. Then, practice exercises and simulations in Microsoft Excel spreadsheets were proposed. Among the simulations performed, were realized comparisons of precipitation trends from different sources available on the Hidroweb website.

It is noteworthy that other actions are underway, with a view to the finalization of the project in July 2020.

2.9. FEASIBILITY ANALYSIS OF IMPLEMENTATION OF INDIVIDUAL WATER MEASUREMENT SYSTEMS IN BUILDINGS IN OURO PRETO - MG

Under coordination of Professor M.Sc. Maria Luíza Teófilo Gandini (GANDINI, M. L. T.) - Department of Civil Engineering

This project started in March 2018 and ended in December 2018, with the participation of 1 student (1 male) of Civil Engineering course, 1 Professor (Prof. Maria Luíza Teófilo Gandini - Department of Civil Engineering).

The thematic axis is Sanitation.

Ouro Preto (Minas Gerais) does not have hydrometers installed and functioning. The data were created and were consummated, and consumption by water catch in Ouro Preto, which is very high. Some methods of dimensioning micrometer have been compared to the standard designs. Feasibility of implementing individual water use systems in Ouro Preto was attested. The constructive method must receive the architectures of each building, implying in minimizing the visual impact, minimizing the impacts and maintaining the maximum originality to an implementation.

2.10. COMPARISON OF SIX METHODS OF DETERMINING THE LONGITUDINAL DISPERSION COEFFICIENT: CASE STUDY AREIAL STREAM

Under coordination of Professor M.Sc. Maria Luíza Teófilo Gandini (GANDINI, M. L. T.) - Department of Civil Engineering

This project started in August 2018 and ended in July 2019, with the participation of 1 student (1 female) of Environmental Engineering course, 1 Professor (Prof. Maria Luíza Teófilo Gandini - Department of Civil Engineering). It was a project supported by PIP/UFOP.

The thematic axis is Water quality.

There are several methods for obtaining and quantifying the longitudinal dispersion coefficient. Currently, the standard procedure is the Routing Procedure, which uses concentration versus time data generated from field studies and iterative data processing techniques. The objective of this work was to determine the longitudinal dispersion coefficient of Aerial Stream from field data produced in tests using sodium chloride as tracer by six different direct methods. It has been realized that simpler methods such as Chatwin's and Krenkel-Thackston's can be very promising, leading to very similar results to the Routing Procedure.

2.11. HYDROLOGICAL MODELING FOR RAIN SIMULATION IN THE RIO DAS VELHAS WATERSHED AS A SUBSIDY FOR THE CPRM CRITICAL EVENT ALERT SYSTEM

Under coordination of Professor M.Sc. Maria Luíza Teófilo Gandini (GANDINI, M. L. T.) - Department of Civil Engineering

This project has been developed since August 2018, with the participation of 1 student (1 female) of Environmental Engineering course, 2 Professors (Prof. Maria Luíza Teófilo Gandini - Department of Civil Engineering and Prof. Ana Letícia Pilz de Castro - Department of Civil Engineering). It was a project supported by CPRM.

The thematic axis is Hydrology.

In order to minimize the various problems faced by the populations of Jequitibá and Pinhão, faced with each flood in the Rio das Velhas basin (the 801 km river das Velhas is the largest tributary in extension of the São Francisco basin) this work aims the elaboration of the hydrological modeling of the Rio das Velhas basin to serve as input to the CPRM Critical Event Alert System. So that populations at risk are not affected by disasters, thus avoiding material losses and especially lives. The project is underway and there are no results yet for the applicable objectives. It took a long time to get basin data, so all preliminary basin characterization was done by remote sensing data freely available on the Internet.

2.12. DIAGNOSIS OF WATER DISTRIBUTION NETWORKS IN CACHOEIRA DO CAMPO AND PROPOSING IMPROVEMENTS

Under coordination of Professor M.Sc. Maria Luíza Teófilo Gandini (GANDINI, M. L. T.) - Department of Civil Engineering

This project started in March 2019 and will end in January 2020, with the participation of 1 student (1 male) of Civil Engineering course, 2 Professors (Prof. Maria Luíza Teófilo Gandini - Department of Civil Engineering and Prof. Gilberto Queiroz da Silva - Department of Civil Engineering).

The thematic axis is Sanitation.

Realizing the difficulty of the Ouro Preto Municipal Water and Sewer Service to map and catalog as information related to the municipal water supply and distribution network, this work aimed to identify and map the distribution networks in the district of Cachoeira do Campo. Among the results obtained, in addition to mapping the coverage areas and distribution networks, it was possible to suggest improvements to the system, lowering the high pressures to avoid future damage to the network and causing better quality water to the final consumer.

2.13. HYDROLOGICAL MODELING FOR DIAGNOSTICS OF FLOOD AREAS: CASE STUDY OF CARIOCA SUB-BASIN IN ITABIRITO - MG

Under coordination of Professor M.Sc. Maria Luíza Teófilo Gandini (GANDINI, M. L. T.) - Department of Civil Engineering

This project started in March 2019 and will end in January 2020, with the participation of 1 student (1 female) of Civil Engineering course, 1 Professor (Prof. Maria Luíza Teófilo Gandini - Department of Civil Engineering).

The thematic axis is Hydrology.

The city of Itabirito suffers frequent flooding and has its main river, Itabirito river, classified as high vulnerability to flooding. The objective of this work was to characterize the rainfall and physiography of the Carioca stream sub-basin, an important tributary of the Itabirito river. To make it possible later to determine the peak flow rates for different return times. Was used the transformation of rain into flow with the aid of HEC-HMS to obtain peak flows. It was concluded that the sub-basin has a high surface runoff generation potential and high flow values for different return times.

2.14. MONITORING OF THE PARAMETERS OF THE WATER QUALITY INDEX AND THE TROPHIC STATE INDEX OF LAGOA DO GAMBÁ, OURO PRETO - MG

Coordination of Ana Letícia Pilz de Castro e Anibal da Fonseca Santiago. It's a project developed by 1 female (Lorena Souza Lima).

The goal of this study was to evaluate the present water quality condition of the Gambá Lagoon, located in the Lagoon neighborhood of Ouro Preto - Minas Gerais (MG), using the Water Quality Index (WQI) and Trophic State Index (TSI). The Gambá Lagoon is located in the middle of the urban space and is abandoned by the majority of the population due to its polluted appearance, both in its surroundings and its water. Two collections were made at four previously chosen points. For the calculations of the Water Quality Index and Trophic State Index, ten parameters were analyzed in laboratory: Escherichia coli, phosphorus, nitrate, pH, total solids, temperature, turbidity, dissolved oxygen, chlorides and chlorophyll-a. From the results of the WQI, TSI and correlations analyzes of the physical, chemical and biological parameters, it was possible to verify that the effects of domestic effluent discharges and the deposition of garbage in the lagoon environments lead mainly to the increase of nutrient contents (mainly phosphorus), presence of algal biomass (chlorophyll-a), increased concentrations of Escherichia coli bacteria, and a "regular" classification of the water quality

index of the lagoon and strong evidence of its eutrophic state. Thus, identifying and analyzing the main problems and correlating them to their supposed agents, it was possible to highlight the most important environmental aspects and to suggest mitigating measures for the feasibility of the use of this public space.

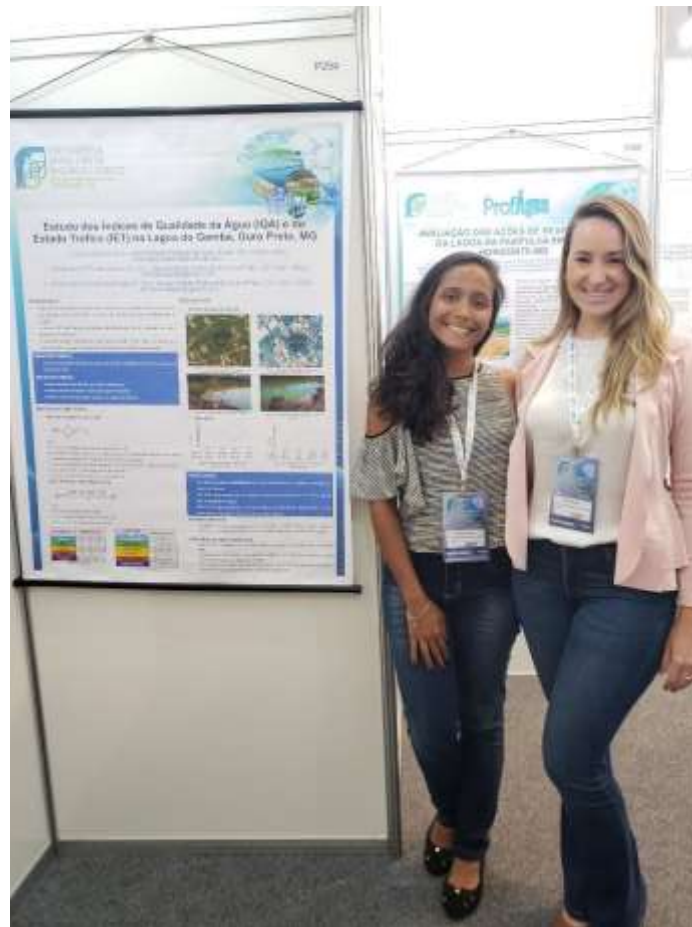


Figure 13: Published in the XXIII Brazilian Symposium on Water Resources.

2.15. STUDY FOR THE IMPLEMENTATION OF RAINWATER COLLECTING SYSTEM FOR THE PUBLIC SCHOOL PEIXOTO GOMIDE IN ITAPETININGA - SP

Coordination of Ana Letícia Pilz de Castro e Maria Luiz Teófilo Gandini. It's a project developed by 1 male (Ramon Seimitsu Kian).

Water is a limited and extremely necessary natural resource for life. Due to all this importance, questions about its conservation and preservation have been gaining prominence in the world. There are conventional and unconventional measures for water conservation. The non-potable rainwater harvesting system is included in the non-conventional measures. This system is a sustainable solution that contributes to the rationalization of water use, providing the conservation of water resources for future generations. The objective of this study is to estimate the potential of saving potable water that could be obtained through the implementation of a

rainwater harvesting system for non-potable uses at the Peixoto Gomide State School in the city of Itapetininga, SP. Initially, data were collected about the population that occupies the school and the water consumption per month. Population data allowed to estimate per capita consumption. The water consumption data from SABESP invoices allowed us to estimate the final uses of water and average monthly and daily consumption. After that, the percentage of potable water used for non-potable purposes was verified, which could be replaced by rainwater. Using the Neptune software, the volumes of the rainwater reservoirs were determined. Thus, it was possible to evaluate the potential of saving potable water, which resulted in 24.78%. An economic analysis of the implementation of the system was also carried out. Through the SINAPI table, the costs related to the implementation of the system were estimated at R \$ 21,667.80, which presented a return period of investment of 3 years and 8 months.

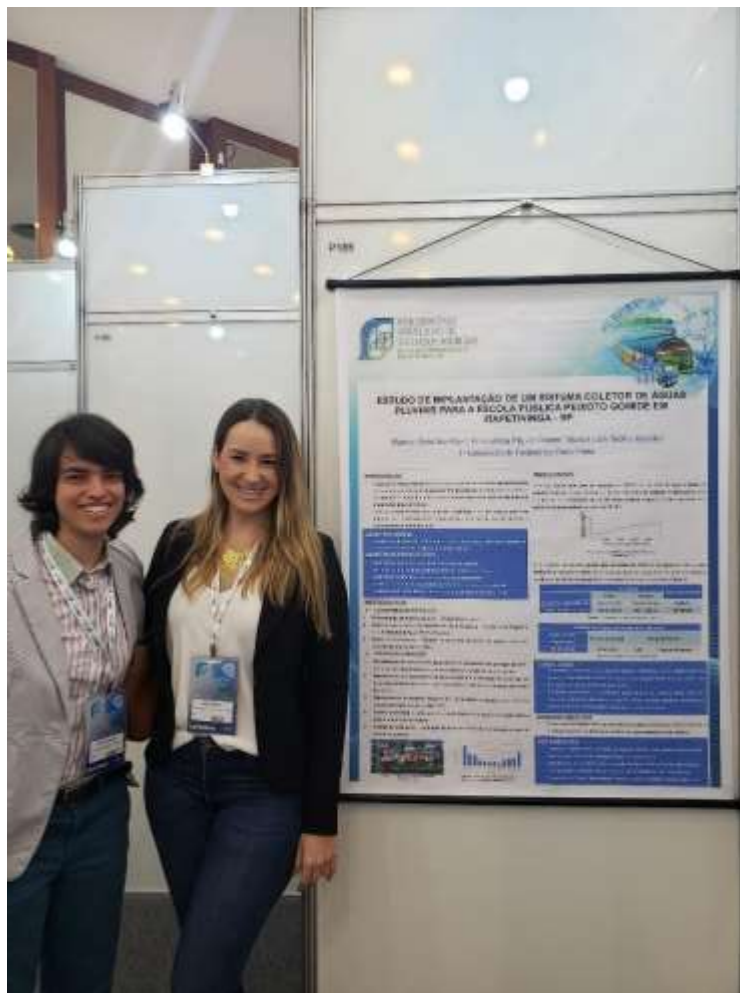


Figure 14: Published in the XXIII Brazilian Symposium on Water Resources.

2.16. SOLID WASTE MANAGEMENT IN TOURIST CITIES, FOCUSING ON OURO PRETO, MINAS GERAIS

Under coordination of Professor Dra. Kerley dos Santos Alves (ALVES, K.S.) - Department of Tourism.

This project has been developed since march 2019, with the participation of students (2 female) of Environmental Engineering and Master Student Environmental Socioeconomic Sustainability courses, It's a research initiation scholarship supported by PIVIC/UFOP.

This work orients itself from a local perspective, knowing that the management of solid waste at Ouro Preto follows the line of other Brazilian cities, most of it is dumped in the garbage without a good and effective collect system and the population remains uninformed. Focused in studying and knowing how the city of Ouro Preto is dealing with the management of solid waste and thinking of Ouro Preto as a potential city for tourism, this work intends to investigate how the waste management is doing so far and the reflex on the aggressive transformation of the landscape, social issues, occupation of areas of preservation and gentrification of public places. In this aspect, it presents itself as a favorable locus also to evaluate how tourism has an impact on the urban landscape caused by the increase of the touristic side and consequently elevating waste production. The work will be based on a qualitative approach from the study and interpretation of official documents, supported by an analysis of current public policies and public managers interviews.

2.16.1 GENDER RELATIONS IN WATER MANAGEMENT DECISION-MAKING IN OURO PRETO

Under coordination of Professor Dr. Kerley dos Santos Alves (ALVES, K.S.) - Department of Tourism and Professor Dr. VeraL. Miranda Guarda (GUARDA, V.L.M.)

This project has been developed since 2019, with the participation of students (1 female and 1 male) Lucas de Souza Prates (Volunteer Degree in Law / UFOP) and Alexsandra Matilde Resende Rosa (Master Student in Socioeconomic Sustainability / UFOP). It's a research initiation scholarship supported by PIVIC/UFOP.

The access to potable water does not related only to economic and environmental factors, but also, social aspects, which is the case of gender matter. Due to remnants of patriarchal system and work division, which remain in today's world, women trajectory is marked by social, economics and political exclusion. There is no exception when it comes to water access. It propose, in international documents and national law, different ways from the traditional in

order to guarantee the sustainable use and enlarge the access to these resources, for example, the participation of all citizens in decisions about the water destination. On this matter, the gender equity gain featured and the women participation in this process gets evident. The lack of water affects the life of the women and they hold important knowledge that can be used to manage this resource. The objective of this research is about knowing the gender interactions, in especial, the perception of the employees who compose the function of the responsible agency for the water manage in Ouro Preto/MG, related to the participation of women employee in these agencies. Bibliographic and field research were conducted with quality approach and questionnaires application to the managers and agency members to achieve this goal in question.



Figure 15: Published in the Encontro de Saberes-Ouro Preto, MG.

2.16.2 CONVIVER: VALUING AND EMPOWERING PEOPLE FOR LIVING TOURISM

Under coordination of Professor Dr. Kerley dos Santos Alves (ALVES, K.S.) - Department of Tourism and Professor Dr. Vera L. Miranda Guarda (GUARDA, V.L.M.)

This project has been developed since 2017, with the participation of students (3 female and 1 male). External contributors: Eberte Moura Bretas, Claudia Coimbra of Espírito Santo, Ana Cristina Ponciano Gomes, Monica Aparecida Domingues. It's a project supported by PROEX Program and Municipality of Ouro Preto.

The project has the partnership of the CRAS Reference Centers of Social Assistance, which are part of the Secretariat of Social Assistance, Housing and Citizenship of the Municipality of Ouro Preto in the planning and actions of activities and referral of the participating public to the weekly activities of the project. The overall objective of the Conviver Project is to raise

awareness and integrate the community into tourism and cultural activity through workshops and courses for self-improvement, with a view to self-esteem and empowerment; professional improvement for technical improvement for tourism and social inclusion of participants through interdisciplinarity. Thus, the project occurs through participatory strategies such as lecture techniques, practical classes, workshops, lectures and technical visits. Currently the number of participants is 30 people, on average, from different age groups and educational levels, involving the community of Ouro Preto (headquarters), Cachoeira do Campo and Santa Rita de Ouro Preto. During the activities, we obtained results such as resumption of studies, search for technical courses, visible posture of belonging to the project, social and productive inclusion and increased self-esteem, since they integrated sharing personal experiences reinforcing their empowerment impact.



Figure 16: Participant assessment of the activity (2019).

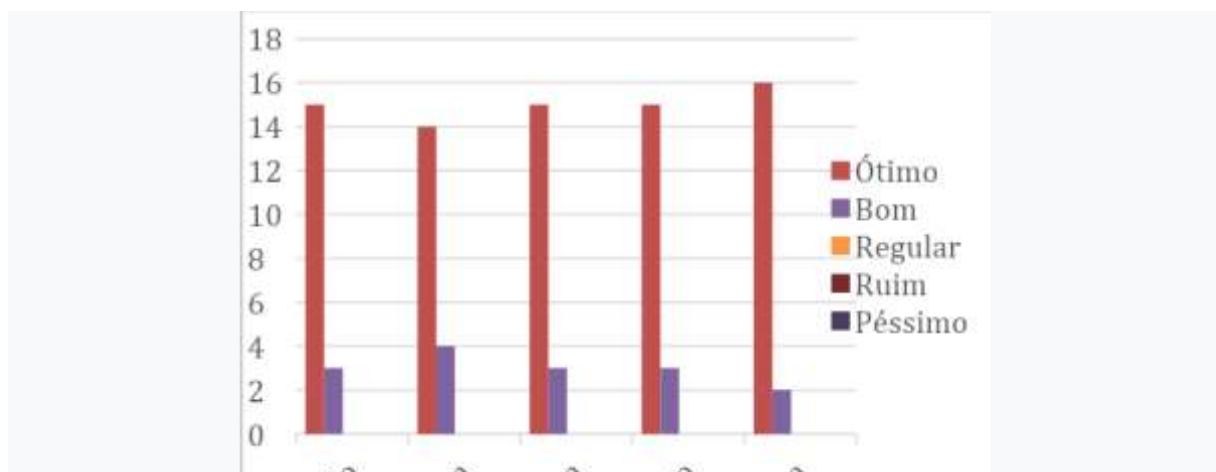


Figure 17: Project Data, 2019.

2.17. GEOCHEMISTRY AND STRATIGRAFIC ANALYSIS OF CUTBANKS SEDIMENTS IN GUALAXO DO NORTE RIVER– MG

Coordination of Prof. Dr. Adivane Terezinha Costa – Department of Geology– Mine Scholl.
Themes: sediments, mining dam post-rupture, environmental damage; It's a project developed by 1 male student (Hugo Miguelito).

The present work has as objective the geochemical and stratigraphic analysis of Gualaxo do Norte river banks, with the purpose of determining the environmental damage caused in a post-rupture context of the Samarco mining company tailings dam. These deposits were accumulated in the riverbanks tops, in this context, the study in question aims to study the deposits from the dam, as well as to elaborate a faciological and geochemical analysis of the sediments of the banks, comparing the post-rupture deposits with pre-rupture deposits. and with similar characteristics, aiming to understand the environmental impacts from a comparative diagnosis with the conditions prior to the dam rupture. The environmental characterization of the area was carried out in order to investigate the methods applied to mitigate the effect of the environmental disaster. It was also analyzed separately each granule bank metric where it could be observed that most of the samples comprise the fractions 0.075 mm (fine sand), with few exceptions, evidencing the influence of the tailings in the area. In the geochemical analysis it was noted values that exceed the geochemical background values for Fe and Mn, and it is possible to notice that all elements correlate with larger elements Fe, Mn and Al, are probably absorbed or adsorbed in high quantities by these elements. present in sediments and favoring the retention growth of high toxicity metals such as Cr, As, V, Sb, Ni, Cu and Zn.



Figure 18: A profile of cutbank sediments showing the clayey top and the gualaxo do Norte river with loose blocks of the cutbank stabilization.

2.18. MEDICAL GEOLOGY AND SOCIO-ENVIRONMENTAL DIAGNOSIS OF THE CITY OF BARRA LONGA, MG, BRAZIL

Coordination of Prof. Dr. Adivane Terezinha Costa – Department of Geology– Mine Scholl.
Themes: gender inequality, women. It's a project developed by 1 female (Clara Castillo).

The rupture of Fundão dam, on november, 2015, has caused socio-environmental losses to the community of Barra Longa-MG due to the intense flood of tailings, which reached the city and its surroundings. The aim of this undergraduate thesis was to accomplish a socio-environmental diagnosis of Barra Longa's region. We performed geochemical temporal data processing of fluvial waters, dust, as well as collect and chemical analysis of superficial soils and sediments from the region. Beyond the impacts on the communities, the mudflow brought on environmental impacts, compromising the quality of water, soils and sediments. Therefore, the health of the region's inhabitants is permanently under harm. Breathing and skin diseases, as well as mental disorders, are the main afflictions reported by the local population, besides worries about the accumulation of heavy metals and its health. Concerning the hydrochemical temporal data of the fluvial water from the Gualaxo do Norte river, it was verified increased turbidity additionally to increased concentration of elements such as Mn, Fe, Al, Pb in rainy season waters; these events are probably related to the tailings' remobilization. It might occur whether the tailings are exposed on banks or along streambeds. Regarding the Dust, some contaminant elements found such as Cd, Ni, Cu e Zn, are influenced by the sorption of the Fe and Mn noticeable in the tailing mud from Fundão dam. It is likely the hypothesis in wich Fe e Mn might be the carrier of the metals in the samples of dust from Barra Longa. It is quite likely that the high concentration of trace elements such as As, Cd e Ni, found in the superficial soil, also weigh on sorption related to Fe and Mn. The high concentration of Fe and Mn, besides being a strong repercussion of Fundão dam tailing, as mentioned above, is also relatable to the geographical and anthropical history of the discussed region.

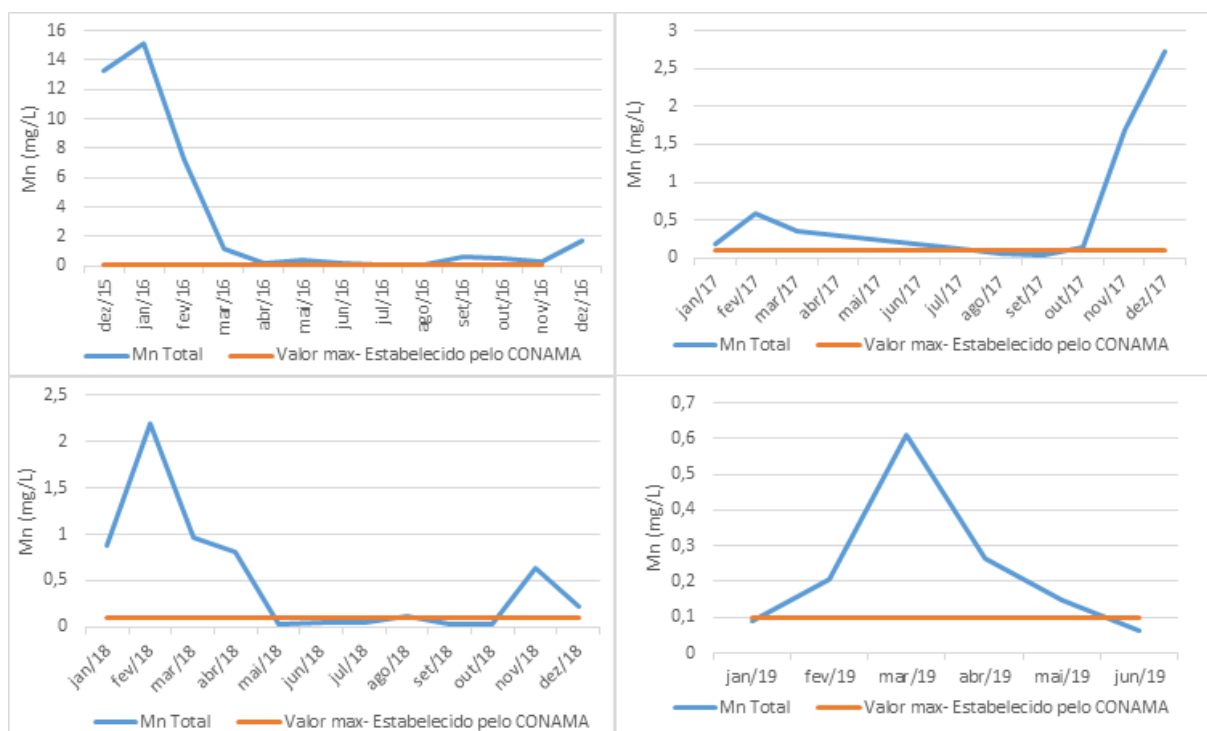


Figure 19: Total manganese result, since the dam burst until the second quarter of 2019, obtained in the special monitoring by IGAM and its limit value, established by CONAMA (2005)

2.19. Vídeo INVENTORY OF MAJOR AND TRACE ELEMENTS OF DRINKING WATER OF OURO PRETO CITY, MG

Coordination of Prof. Dr. Adivane Terezinha Costa – Department of Geology– Mine Scholl. Themes: water education, water quality. data-bases development It's a project supported by FNDE/MEC and developed by 4 female and 3 male.

The partnership with SEMAE-OP, has the objective of monitoring the quality of the water used for public supply of the headquarters and districts of the municipality of Ouro Preto. With the period of social distancing caused by the spread of the COVID-19, social media and digital platforms have become the main space in the search for information. Thinking about it, the students of PET Geological Engineering made explanatory videos, seeking to disseminate the project "Water, health and science for all", also responsible for collecting and analyzing the quality of the drinking waters of the region of Ouro Preto, MG. The posts of the material in the networks obtained positive evaluations from several people in the community, students and student entities.

Follow the links to access the videos:

<https://www.youtube.com/watch?v=wwvZGw1fJbw&t=2s>

https://www.youtube.com/watch?v=H3KPQ0fDCdo&list=PLbflFlXwruF--5N9_S0tGppYTn5jaMBFY&index=2

https://www.youtube.com/watch?v=OkxLfI8fkRU&list=PLbflFlXwruF--5N9_S0tGppYTn5jaMBFY&index=3

https://www.youtube.com/watch?v=vzJgwwPIFxo&list=PLbflFlXwruF--5N9_S0tGppYTn5jaMBFY&index=4

2.20. UFOP DAM RUPTURE CONSEQUENCES STUDIES NETWORK

Coordination of Prof. Dr. Adivane Terezinha Costa – Department of Geology– Mine Scholl. Themes: mine, environment and sustainability, development. It's a project supported by FNDE/MEC and PROEX/UFOP and developed by 3 female and 1 male.

The project aims to map all studies associated with the mining dam rupture within the Federal University of Ouro Preto, channeling them into a single database on a digital platform, accessible to all, facilitating communication between coordinators of actions in UFOP and other national and international institutions in the aspects of teaching, research and extension .. In addition, in this pandemy year, we had the promotion of webinars through srteam yard with the participation of internal and external entities and direct transmission by yotube, where adding the two videos we had around 70 listeners interacting by chat and over 400 views so far.



Figure 20: Webinar about consequences of tailings in river.

2.21. WEBINARS: EXPERIENCE OF WOMEN FROM GEOSCIENCES IN THE JOB MARKET

Coordination of Prof. Dr. Adivane Terezinha Costa – Department of Geology– Mine Scholl. Themes: Development, gender. It's a project supported by FNDE/MEC and developed by 7 female.

PET Geological Engineering in partnership with the Brazilian Association of Women in Geosciences (ABMGeo - Núcleo Ouro Preto) and the Nucleus for Teaching, Research and Extension of the Unesco Chair (NUCAT UFOP), conducted a series of webinars and lives with the objective of presenting the experiences of geoscientist women in the different areas of geology, presenting technical content and conversations about the life trajectory of these women, choice of professional area, activities they perform, challenges encountered, etc. The target audience were undergraduate students and interested professionals. Five webinars and two lives were held with an average duration of one hour and thirty minutes each. The platform used was the Stream Yard and the live broadcast on the Youtube PET channel between August and November 2020. Twelve geoscientists were invited to discuss topics such as mine geology, geophysics, hydrogeology, mineral exploration, among others. On average, the webinars and lives had 32 simultaneous viewers during each live broadcast and a total of 328 views after the publication of the videos on Youtube channel. At the end of each live, a certificate was issued to the participants and a research form was sent. Of the 65 people who filled out the certificate form, 70% were female. The average age of the total people was 27 years old.



4º WEBINAR

Exploração mineral e Prevenção de desastres naturais através de vivências femininas



LARISSA MONTANDON

Bacharel em Geologia pela UFMG (2010). Mestre em Gestão de Risco Geológico pela UFOP (2017). Atualmente é Pesquisadora no Serviço Geológico da Brasil-COPM na Gerência de Hidrologia, Hidrogeologia e Gestão Territorial - GERITE-BR.

Geóloga e mestre pela UFMG com foco em análise de bacias sedimentares. Pós-graduada em sismotectônica pela UERJ. Há quatro anos trabalhando com exploração mineral na Nova Resources, com pesquisa generativa de mineral base em seqüências sedimentares brasileiras, do proterozoico ao cretáceo.



MARIANA MEIRELES LEITE

Realização

29
SET

Com certificado
Terça - Feira
17 horas





AO VIVO PELO YOUTUBE
▶ PET ENGENHARIA GEOLÓGICA

LIVE



Identificação de falhas, fraturas e carste em um campo do Pré-Sal utilizando atributos sísmicos geométricos

TATIANA ALICE SOARES DE OLIVEIRA



Graduada em Engenharia Geológica em 2011 na UFOP. No mesmo ano entrou para a Petrobras e começou a trabalhar como geofísica de reservatórios de petróleo, trabalho que desenvolveu por 8 anos. Possui pós-graduação em Interpretação Sísmica (pela UERJ) e mestrado em Geociências, com ênfase em mecânica de rochas, pela PUC-Rio. Atualmente trabalha na Petrobras como gerente de treinamento.

Realização






15
OUT

Com certificado
Quinta - Feira
17 horas

AO VIVO PELO YOUTUBE

▶ PET ENGENHARIA GEO

42

2.22. PRÓ-MANANCIAIS PROGRAM: PARTICIPATORY WATER MONITORING IN THE RIBEIRA DO PRATA BASIN

Coordination of Prof. Dr. Adivane Terezinha Costa – Department of Geology– Mine Scholl. Themes:.. Development, water quality, erosion. It's a project supported by FNDE/MEC and developed by 2 male.

The Ouro Preto region, located in the southeastern portion of Quadrilátero Ferrífero, state of Minas Gerais, Brazil, is considered of high relevance in the national hydrological scenario, since it acts as watershed for both the São Francisco and Rio Doce basins, which together, correspond to 8.4% of the Brazilian territory. This project results from a partnership with COPASA's Pró-mananciais program focused on participatory water monitoring strategies with collaboration of other public (PET, NUCAT) and private institutions (Vale, Copasa and local mining companies), along with representatives of popular organizations that seek springs preservation, such as the Ribeirão do Prata Colective and Nascente Subcommittee on Hydrographic Basins. The program aims to improve the quality of water in the locality through environmental diagnosis and implementation of solutions designed to improve water management, as well as raising awareness of the local population about possible improvements to be adopted in daily activities in order to minimize harmful impacts. In this context, the goal of this study is to understand the relationship between water quality and ongoing large erosive processes that affect the region. Many of these surficial erosive processes, if uncontrolled, advance in width and depth until they reach the water table level. From this point on, headward erosion is the dominant erosive process. Initially, the Ribeirão do Prata basin was selected, which is located within the Rio das Velhas basin, between the districts of Santo Antônio do Leite and Amarantina, in Ouro Preto, for being intensely affected by active large-scale gully erosion, which today compromise more than 10% of the entire basin area. Thematic maps highlighting lithological, geomorphological and pedological aspects were made, including land use and delimitation of erosion fronts. The basin is positioned over the basement of granitic and gneissic rocks with high feldspars content in advanced alteration state to latosol, on undulated terrain with little vegetation cover. The combination of these features characterizes the region as of being highly favorable for erosions to develop. The progress of these erosive processes is directly related to the quality of water, since it interferes with the amount of sediments in suspension, influencing factors such as turbidity, and also promoting undesirable effects such as downstream aggradation. Based on the gullies mapped in the basin, a pilot erosion was selected to test implementations capable of stabilizing and containing the development of an active erosion, thus increasing rainwater infiltration and reducing the amount of suspended sediment in springs and streams. The interventions are underway.

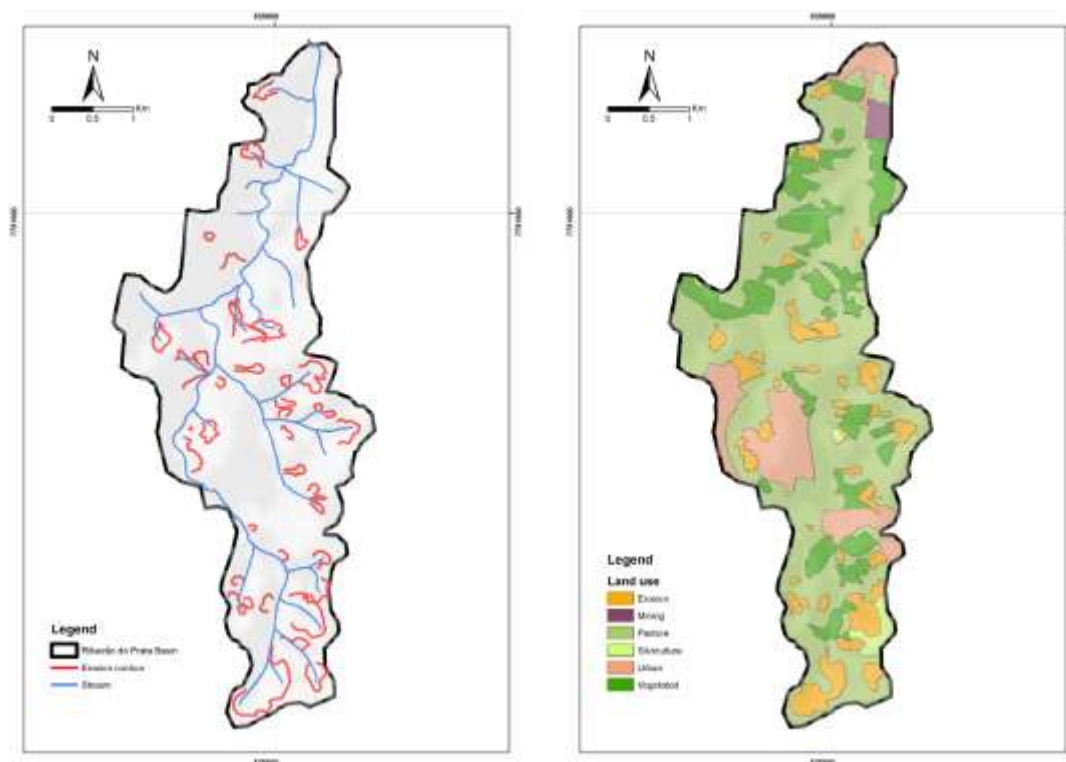


Figure 22: Maps with delimitation of the erosions of the studied basin and land use and occupation and photos of the partners in the field.

2.23. STUDY OF SEDIMENTS BY ANTÔNIO PEREIRA AND SANTO ANTÔNIO DO SALTO IN AN ATTEMPT TO CORRELATE METALS PRESENT IN THE SAMPLES WITH THE FOGO SELVAGEM DISEASE

Coordination of Prof. Dra. Ângela Leão Andrade – Department of Chemistry. Themes: metals and fogo selvagem. It's a project supported by CNPq and developed by 3 female.

Pemphigus foliaceus, also known as Wild Fire, is an autoimmune skin disease. It is thought to have environmental triggers, such as mercury and ore dust. Antônio Pereira and Santo Antônio do Salto, two districts of Ouro Preto, are identified as foci of this disease, with a prevalence of 0.9 and 1.0 percent, respectively, a much higher rate than in the rest of the country. In this

work, sediments from these two districts of Ouro Preto will be studied, in an attempt to correlate their chemical composition, with this disease.

Initial tests have already been carried out. The sample preparation method was evaluated based on a complete factorial experimental design 2³. The variables (factors) studied in the planning were: HNO₃ concentration; sonication time (bath); and the bath temperature.

It is possible to observe that, except for Cu, tests 4 and 8 showed the highest recovery values, in which temperature was the only difference between them. In addition, these tests are those with the highest concentration of acid and bath time. This means that temperature does not seem to be such an important factor in extracting larger quantities of the elements from sediment samples. Still, observing the other two tests with the levels +1 for the concentration (tests 2 and 6), it is noticed that there was a small drop in the recovery values, but these are still greater than those obtained for the tests of level -1 (tests 1, 3, 5 and 6). In other words, the concentration factor seems to be very important, and the time factor also causes a slight influence on the amount of element extracted from the sample matrix.

2.24. HANDLING AND PRODUCTION OF HYGIENE PRODUCTS

Coordination of Prof. Dr. Eleonice Moreira Santos - Department of Food - Nutrition School. Themes: environmental education, hygiene and health, cleaning products. It's a project supported by PROEX/UFOP and developed by 3 females.

The project handling and production of hygiene products is an action that aims to offer workshops and educational materials that are easy to understand to teach how to properly produce and use cleaning products, personal and domestic hygiene, in addition to providing guidance on the concepts of hygiene. Due to the pandemic, face-to-face meetings were replaced by remote actions, in order to relate the project's objectives to the current situation, transmitting relevant information to the community relating hygiene as a preventive measure to the COVID-19 pandemic. Weekly, the preparations of cleaning and personal hygiene products were published on social networks through the profile "Golden Tips UFOP" on Facebook and Instagram. All the material was made with images using simple language and low-cost materials, to reach a diverse audience. 63 posts were made on social networks that included tips on how to properly wash your hands, soap production, disinfectants, room cleaning products, even toothpaste. These posts reached a total audience of approximately 600 people, about 70% women, distributed mainly in cities in the state of Minas Gerais, in addition to other

regions of Brazil and other countries. The public served interacted with the publications, through likes, public comments, and private messages with compliments, doubts and suggestions for adaptations in the preparations, which shows the exchange of experiences and awareness about the handling and production of hygiene products. Given this, it is concluded that the initiative of remote actions has collaborated in the dissemination of knowledge to the community, encouraging the production and correct use of hygiene materials, as a way to contribute to the maintenance of health.



Figure 23: Contents of posts made on hygiene.

2.25. NON-STATIONARITY ANALYSIS OF INTENSE RAINS IN BELO HORIZONTE METROPOLITAN REGION: Impacts and measures of urban resilience

Under coordination of Professor Dra. Aline de Araújo Nunes (NUNES, A.A.) - Department of Urban Engineering

This project was developed with the participation of 3 students (2 female and 1 male) of Environmental Engineering course, 2 Professors (Prof. Bárbara Mendanha and Prof. Aline de

Araújo Nunes - Department of Urban Engineering) and 1 researcher of CPRM - Geological Survey of Brazil (Dr. Eber José de Andrade Pinto). It was a project supported by CNPQ.

The perception of a changing climate, which also impacts hydrological processes, is already a widespread idea. However, the way of dealing with the changing nature of the climate, especially in relation to statistical analysis, is still the subject of discussion, being essential to survey the characteristics of study region. In this context, the objective of this work was to study intense rains in Metropolitan Region of Belo Horizonte, through statistical analysis, aiming at a better understanding of the variability of these events in the scope of the capital and cities in metropolitan region. To this end, the acquisition and preliminary analysis of precipitation data were carried out, with one station selected in Belo Horizonte and two stations in the metropolitan cities of Vespasiano and Caeté. For data analysis, we opted for a test of multiple comparisons between the pairs of stations analyzed and a factorial design. The results showed that there is a significant difference between maximum rainfall intensities in Belo Horizonte and metropolitan cities, emphasizing that those in the capital are higher. Additionally, there is a tendency for growth in rainfall intensities associated with shorter durations in Belo Horizonte, although the same behavior is not observed in metropolitan cities.

2.26. EVALUATION OF FLOODING PRECIPITATIONS IN SMALL BASINS: A CASE STUDY FOR RAPOSOS AND RIO ACIMA (MG)

Under coordination of Professor Dra. Aline de Araújo Nunes (NUNES, A.A.) - Department of Urban Engineering

This project has been developing since September 2020 with the participation of 3 students (2 female and 1 male) of Urban Engineering course, 2 Professors (Prof. Bárbara Mendanha and Prof. Aline de Araújo Nunes - Department of Urban Engineering) and 1 researcher of CPRM - Geological Survey of Brazil (Dr. Artur José Soares Matos). It is a project supported by CNPQ.

Floods are recurring natural events that result from different types of rain, whether intense or prolonged, and which exceed the potential for soil infiltration. In this sense, the study of floods is a complex process, since these correspond, in most cases, to natural phenomena and that involve a variety of factors. It is observed, therefore, that over the years there has been an increasing need for the definition of methods for estimating floods in different fields of action, with the creation of hydrological models being a very convenient tool for various services and monitoring in Water Resources Engineering. In this context, the Mineral Resources Research

Company (CPRM) makes use of some hydrological simulation models, which assist in the operation of the Critical Events Alert System (SACE) throughout Brazil. Among the basins monitored by this System is Rio das Velhas basin, which includes the cities of Rio Acima and Raposos, case studies of this research. However, considering the difficulty of reaching a reasonable period of time in the alert for cities that are in headwater regions, as is the case of Rio Acima and Raposos, they are not yet part of SACE. Thus, aiming to contribute to the future inclusion of these cities in the hydrological forecasting system of CPRM, this research seeks to evaluate the precipitations causing floods in the locality, considering this one of the steps for the implementation of a hydrological model for the region. To this end, events will first be identified in which alert and flood flows have been reached, so that they serve as a parameter to calculate the average rainfall in the basins on the day of the peak of the hydrograph and with 1, 2, 3, 4, 5, 7, 10 and 14 days of antecedence; and total the accumulated rain from the beginning of the rainy season (September 1) to the peak date of the hydrograph. Subsequently, the precipitation zones that characterize probable flooding and probable non-flooding will be identified by means of graphs, as well as a precipitation limit from which there may be flooding. Finally, it is envisaged that the results of this work can be used in the operation of the alert system for the cities of Rio Acima and Raposos, allowing for a greater advance in the period of flood forecasting.

Considering the project execution time, there are still no results for the specific objectives, however, preliminary and essential actions have already been performed and are underway for their execution, with a view to the finalization of the project in August 2021.

2.27. RESTORATION OF URBAN RIVERS AS A STRATEGY FOR A MORE SUSTAINABLE CITY: A CASE STUDY FOR THE RIO DO CARMO, IN OURO PRETO - MG

Under coordination of Professor Dra. Aline de Araújo Nunes (NUNES, A.A.) - Department of Urban Engineering

This project has been developing since September 2020 with the participation of 3 students (2 female and 1 male) of Urban Engineering course and 3 Professors (Prof. Bárbara Mendanha, Prof. Bárbara Abreu and Prof. Aline de Araújo Nunes - Department of Urban Engineering). It is a project supported by PIP UFOP.

The urbanization process, which started the disorganized growth of cities around the world, has reflected over time in the disordered occupation of riverside areas, in the waterproofing of the soil and in the growing neglect of water quality. Urban rivers, in particular, were structured

as mere channels, leaving aside the physical and environmental aspects involved. It can be seen, then, that although rivers are living systems, in the scope of cities they are treated in a fragmented way, disregarding the complexity involved in the entire environment that is in their surroundings. In view of this problem, in the last decades there has been an increasing mobilization in order to make the population aware of the continuous enhancement of the urban landscape, since with a strategic action on the public space it is possible to create projects that integrate urban development with the enhancement and preservation structural elements of the city. In this context, the general objective of this work is to propose interventions associated with the river restoration of the Carmo stream basin, in an area located in the municipality of Ouro Preto - MG, based on the current state of degradation of the river systems and the conditions urban areas of its insertion area, as well as aspects related to the impact and costs of the solutions. To this end, the diagnosis of fluvial and urban environments will be carried out, considering a detailed characterization of the stream and the hydroclimatological conditions of the region, the sociocultural survey of the area and the urban equipment that are present, as well as the understanding of the relationship between the resident population on site and the watercourse, through the application of questionnaires. In a second stage of the project, the design of intervention alternatives will be carried out, through the analysis of the collected data and the evaluation of the restoration potential of the area. Finally, the analysis of the feasibility of the alternatives presented will be carried out considering aspects such as the acceptance of the population, cost-benefit, access to specialized labor, resources and maintenance of the work, with the proposition of a project of river restoration of viable feasibility, considering the various aspects mentioned.

Considering the project execution time, there are still no results for the specific objectives, however, preliminary and essential actions have already been performed, and are underway, for their execution, with a view to the finalization of the project in August 2021. Figure 7 shows some photos of the study area, obtained in a field visit.



Figure 24: Field visit on the Carmo River - Ouro Preto (MG).

2.28. PARTICIPATORY PLANNING AND MANAGEMENT OF WATER RESOURCES IN URBAN CENTERS: VISION OF THE RIO DO CARMO RIVER BASIN SOCIETY (OURO PRETO - MG)

Under coordination of Professor Dra. Aline de Araújo Nunes (NUNES, A.A.) - Department of Urban Engineering

This project has been developing since September 2020 with the participation of 3 students (2 female and 1 male) of Urban Engineering course and 2 Professors (Prof. Bárbara Mendanha and Prof. Aline de Araújo Nunes - Department of Urban Engineering).

The urbanization process, which started the disorganized growth of cities around the world, has reflected over time in the disordered occupation of riverside areas, in the waterproofing of the soil and in the growing neglect of water quality. Urban rivers, in particular, were structured as mere channels, leaving aside the physical and environmental aspects involved. It can be seen, then, that although rivers are living systems, in the scope of cities they are treated in a fragmented way, disregarding the complexity involved in the entire environment that is in their surroundings. In view of this problem, in the last decades there has been an increasing mobilization in order to make the population aware of the continuous valorization of rivers in the urban landscape, since with a strategic action on the public space it is possible to create projects that integrate urban development with the valorization and preservation of the city's

structural elements. In this context, the general objective of this work is to evaluate the vision of the population that resides in the Rio do Carmo Hydrographic Basin, more specifically in the Barra district, inserted in the municipality of Ouro Preto - MG, with regard to the participative planning and management of water resources in the region. To this end, a public opinion survey will be conducted, through the application of questionnaires. It is intended to assess whether the individuals in question feel like effective participants in the planning and construction processes of hydraulic works in the region, the perception of the quality of river water and public water supply and how much they feel included in procedures changing the urban environment. Then, with the collected data in hand, the next part of the project will be the analysis and interpretation of the same, being of fundamental importance the application of some statistical analyzes. In this context, graphs will also be plotted, based on the information collected and also from sources such as IBGE, associating population and location characteristics, looking for patterns between each part of the applied questionnaire. With this information, the results will be interpreted, consolidating a process of identifying the impacts of social participation, or lack thereof, within the planning and management of water resources in the study area.

Considering the project execution time, there are still no results for the specific objectives, however, preliminary and essential actions have already been performed and are underway for their execution, with a view to the finalization of the project in August 2021.

2.29. SIZING OF RESERVOIRS FOR RAINWATER STORAGE AND HYDROLOGICAL MODELING OF SCENARIOS. CASE STUDY IN THE BARREIRO REGION - BELO HORIZONTE / MG

Under coordination of Professor Dra. Ana Letícia Pilz de Castro (CASTRO, A.L.P.) - Department of Civil Engineering

This project has been developing since march 2020 with the participation of 1 student (1 female) of Civil Engineering course and 2 Professors (Prof. Ana Letícia Pilz de Castro - Department of Civil Engineering and Prof. Mateus Oliveira Xavier - Department of Architecture and Urbanism).

Floods are as old as the history of civilization, given that man has always been driven, by necessity, to establish himself close to water courses to obtain resources and survive. In recent decades, however, due to the increase in the urbanization process, this phenomenon has been negatively influenced, with its flooding area considerably increased when compared to the last decades. Living with flood events has become increasingly frequent and intolerable, bringing

constant security risks to the population and neighboring structures, in addition to causing human losses and increasing economic losses. Therefore, it became necessary to adapt to the natural dynamics of these water bodies and drainage systems and devices were born. Currently in Brazil the most used method to “solve” the problem is to take the accumulated water to another location that does not compromise society. However, it is clear that the solution is not as effective, with flood problems recurring in the news. Thus, a new method is gaining more space every day, known as compensatory techniques, this method consists of techniques that aim to reduce the flow of water at the source and favor infiltration and thus prevent the water from continuing its intense flow to regions inhabited. In this context, the present work aims to analyze the floods in the Barreiro region, in Belo Horizonte - MG, focusing on the sub-basins of Córrego do Jatobá and Ribeirão Barreiro, to study their hydrological conditions and to propose compensatory techniques in order to reduce problems recurrent flooding in the region.

2.30. SUSTAINABLE SANITATION

Under coordination of Professor Dr. Paulo de Castro Vieira (VIEIRA, P.C.) - Department of Urban Engineering

This project has been continuously developed since 2017 with the participation of undergraduate students from the undergraduate courses in Architecture and Urbanism and Urban, Civil and Environmental Engineering and from the post-graduate program in the Socioeconomic and Environmental Sustainability program at UFOP, where it was a teaching, research and extension group called Sustainable Sanitation was created.

Within the scope of the research, studies were carried out to characterize the basic sanitation conditions in social and subnormal areas of Ouro Preto and of a broad aspect related to COVID-19. In relation to the topic focused on areas of social interest, this year of 2020, research was concluded in the Padre Farias neighborhood, one of the oldest locations in Ouro Preto, where two areas of social interest are located, characterized by the lack of adequate urbanization, being a recognized in municipal law and the other in irregular conditions. These subnormal areas have approximately 150 inhabitants. The results of this research were presented at a national event (1st Brazilian Symposium on Cities + Resilient), according to the information presented at the end. The article and the presentation video in Portuguese can be accessed on the group's website. In relation to COVID 19 (Sars-cov-2), the group carried out extensive research on ways of contagion and prevention based on the basic sanitation components of the “inside door” (inside the house): drinking water, rainwater, sanitary sewage and solid waste. This research generated a publication in a booklet format called “Practical tips on sustainable

sanitation for the pandemic period and beyond - We need to redouble our daily care”. The booklet in Portuguese can be accessed on the group's website.

Within the scope of the university extension, training activities in environmental education and sustainable health were carried out with the population located in areas of social interest and others interested in the implementation of the environmental sustainability of basic sanitation recommended in the Sustainable Development Goal 6 - Drinking Water and Sanitation of the Agenda 2030 of the UN. These actions can be seen in the video of the YouTube channel. Face-to-face activities, meetings and workshops were developed on the use of rainwater, sewage treatment and solid waste management at the São Cristóvão neighborhood association before the suspension of face-to-face activities (March 2020). After the decree of the pandemic state of COVID-19 (Sars-cov-2) and the suspension of face-to-face activities at the university, remote activities were carried out over the internet as webinars to debate the contents of the booklet “Practical tips on sustainable sanitation for the pandemic period and beyond”, as seen on the YouTube channel. To facilitate communication with the public, a folder-type version was developed with more summarized information. This booklet can be accessed on the group's website. The booklet also won a second version for the Historic Cities of Minas Gerais with the indication of contacts of actors from the public, private and organized civil society who perform basic sanitation services in thirty historic cities in Minas Gerais. This booklet can be accessed on the group's website. Also watch the video presentation of the booklet for historic cities on the YouTube channel. It is estimated that the extension activities directly served (views and certificates issued) 352 people (70% women; 26% men and 4% others) and indirectly (based on the family cycle of 3.24 people per household) 1140 people.

In relation to education, due to the suspension of face-to-face classes, the sustainable sanitation disciplines expected to be offered at undergraduate (Special Topics in Sustainable Sanitation) and at postgraduate courses (Sustainable Cities and Public Policies and Management of Basic Sanitation Services) do not were offered, but the group was brought together in seminars held over the internet through videoconference by Google Meet to present works by undergraduate and graduate students related to the group's theme.

Works published in 2020 by the Sustainable Sanitation group (in Portuguese): available on the website <http://saneamentosustentavel.ufop.br/>

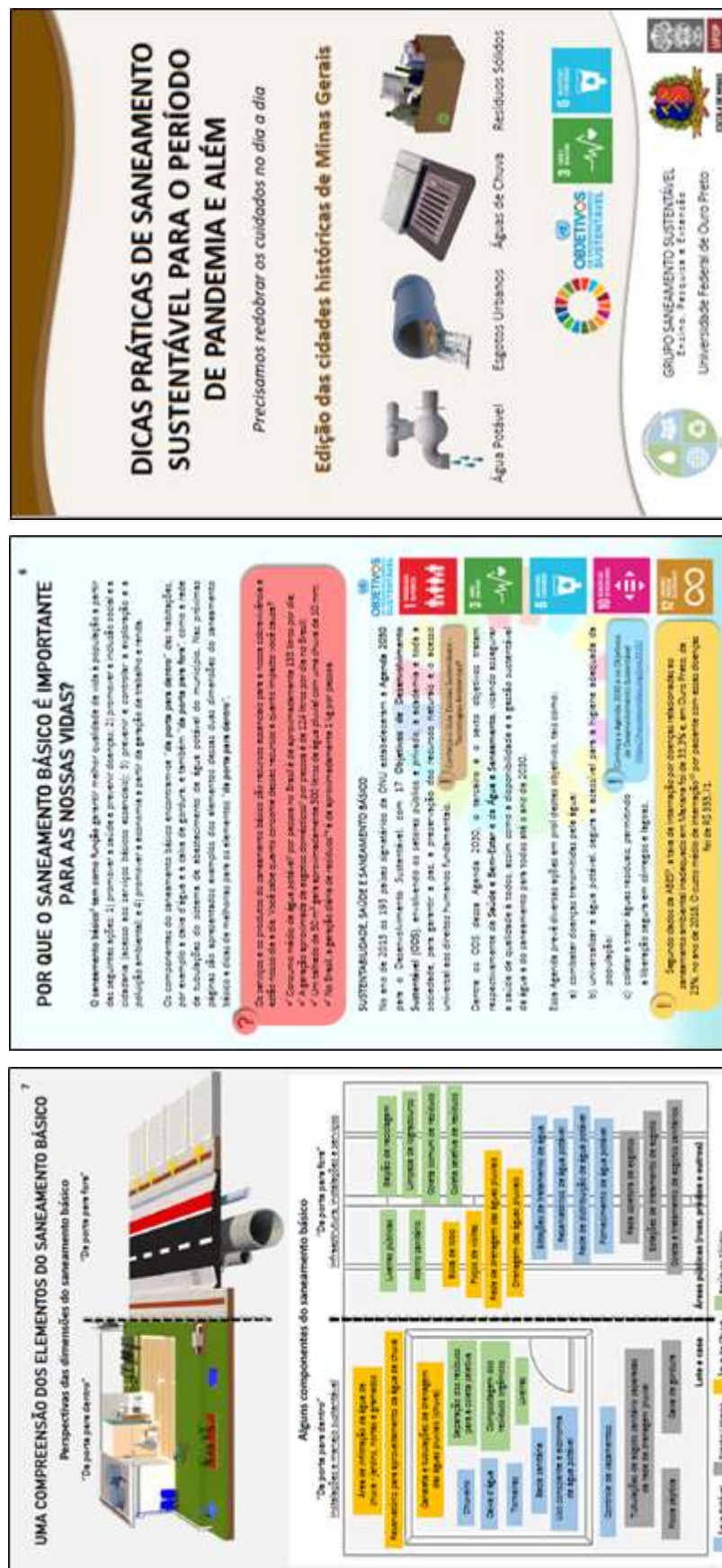


Figure 25: Booklet - Practical tips on sustainable sanitation for the pandemic period and beyond.

Certifique-se de que a cópia é detalhada



escaneie aqui

DICAS PRÁTICAS DE SANEAMENTO SUSTENTÁVEL PARA O PERÍODO DE PANDEMIA E ALÉM

Precisamos dobrar os cuidados no dia a dia






Água Potável

Esgotos Urbanos

Águas de Chuva

Resíduos Sólidos



GRUPO SANEAMENTO SUSTENTÁVEL
Ensino, Pesquisa e Extensão
Universidade Federal de Ouro Preto

Realização



GRUPO SANEAMENTO SUSTENTÁVEL - UFOP
Ensino, Pesquisa e Extensão

Apoio



Colaboração



Universidade Federal de Ouro Preto, Escola de Minas, Campus
Universitário Monte da Cruzeiro, Ouro Preto, Minas Gerais, Julho, 2020

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Saneamento básico é constituído por: abastecimento de água potável, esgotamento sanitário, drenagem das águas de chuva e manejo dos resíduos sólidos. Os Componentes estão dispostos:

- ✓ "da porta para fora" – infraestrutura e serviços;
- ✓ "da porta para dentro" – instalações e manejo sustentável.

Por que o Saneamento Básico é importante para as nossas vidas? (1) promover a saúde e prevenir doenças; (2) promover acesso aos serviços essenciais; (3) evitar a degradação do meio ambiente e; (4) promover trabalho e renda.

É fundamental que todos tenham acesso ao saneamento básico, para que tenham condições adequadas de higiene e saúde e, assim, possam evitar o desenvolvimento de doenças como a Covid-19 e outras mais comuns em nosso dia a dia, como hepatite, diarreias, febre tifoide, cólera e leptospirose.

Dicas para tratarmos os elementos do saneamento básico no dia a dia de forma sustentável

ÁGUA POTÁVEL

1. Utilize apenas água potável para beber, preparar alimentos e fazer higienizações. Água potável é aquela que foi tratada corretamente e distribuída pela autoridade competente.
2. Faça higienização pessoal, de objetos e de ambientes públicos e coletivos. Lave as mãos. Utilize água sanitária para a limpeza doméstica.
3. Lavatórios públicos são importantes para higienização de pessoas e precisam de manutenção e limpeza frequentes.
4. Economize e cuide de sua água. Verifique se há vazamentos em sua casa e faça o reparo. Para vazamentos em áreas públicas, avise os responsáveis em seu município.

Para a prevenção da Covid-19, utilize sempre água potável para as higienizações

ESGOTOS SANITÁRIOS

1. Conecte as tubulações de esgoto da sua casa diretamente à rede pública coletora de esgotos
2. Caso não haja tratamento público em sua localidade, utilize em sua casa alguma forma de tratar os esgotos, como a fossa séptica
3. Faça a manutenção das instalações prediais da sua moradia, para evitar mau odor, transbordamentos, proliferação de vetores e ineficiência do tratamento
4. Evite utilizar ou ter contato com córregos, rios e lagos que recebam esgotos sanitários, pois estes podem conter protozoários, bactérias e vírus causadores de enfermidades
5. Faça o correto reuso de águas servidas, como aquelas provenientes da máquina de lavar roupas e da pia da cozinha. Separe-as da água potável e só utilize-as para fins não potáveis
6. Não descarte em sanitários e pias objetos como plásticos, trapos, óleo de cozinha, preservativos, fraldas, absorventes femininos e outros.

Caso utilize água de chuva e ou faça o reuso de águas servidas, tenha cuidado redobrado em casos de suspeita da Covid-19. Na dúvida, não utilize estas águas

ÁGUA DE CHUVA

1. Águas de chuva devem ser coletadas nas propriedades urbanas e encaminhadas para a sarjeta ou para a tubulação coletora da rua
2. Faça manutenção frequente e correta das instalações prediais de drenagem pluvial da sua propriedade utilizando os EPIs apropriados
3. Não entre em contato com as águas do sistema

público de drenagem pluvial em áreas urbanizadas e também de rios, riachos ou lagos que recebam essas águas, pois elas podem conter contaminantes

4. Evite impermeabilizar as áreas livres da sua propriedade, para facilitar a infiltração da água da chuva no solo
4. Faça o aproveitamento da água da chuva. Garanta que seu reservatório seja de acesso restrito e separado da água potável.

Veja como fazer o manejo sustentável dessas águas

RESÍDUOS SÓLIDOS

1. Produza menos resíduos na sua casa e nos ambientes que frequenta. Privilegie produtos que não possuam embalagens e materiais descartáveis.
2. Separe todos os resíduos gerados na sua casa. Acondicione-os de maneira adequada para a destinação final ambientalmente correta
3. Resíduos Recicláveis - separe, acondicione e encaminhe-os para a coleta seletiva ou para um ponto de entrega voluntária de recicláveis
4. Orgânicos - separe estes resíduos para serem reaproveitados com a compostagem doméstica
5. Rejetos - acondicione e encaminhe para coleta pública no horário correto
6. Destine corretamente também: medicamentos vencidos, resíduos eletrônicos, pilhas, resíduos volumosos e podas, entulho de obras e demolição

Feça o descarte correto dos EPIs usados para combater a disseminação do coronavírus: coloque as máscaras e luvas em duas sacolas plásticas, identifique o conteúdo e descarte junto ao resíduo

Em domicílios com casos confirmados ou suspeitos de Covid-19, não entregue o resíduo reciclável aos catadores. Identifique na sacola que os resíduos podem estar contaminados com o vírus e deixe-o em um local separado, armazenado em quarentena, ou encaminhe-o para a coleta e disposição final adequada

Figure 26: Folder - Practical tips on sustainable sanitation for the pandemic period and beyond. Access the Group's website.



Figure 27: Presentation of work at the Knowledge Meeting - Extension Seminar 2020 at UFOP - Access the Group's website.



Figure 28: Webinar - Presentation panel of the booklet “Practical tips on sustainable sanitation for the pandemic period and beyond”- Access the Group's website.

3. Collaboration and linkages (specify activities which involve other UNESCO chairs and/or members of the water family)

- Evaluation of IHP-VIII, Members of the IHP Water Family - meeting at UNESCO Headquarters, Paris, in early 2020, to prepare the Consolidated draft Strategic Plan of IHP-IX.
- Submission of information to IHP regarding the Consolidated draft Strategic Plan of IHP-IX.

- Submission of data and information to IHP regarding capacity-building in 2019 held by the Water Women and development Chair of the UNESCO Water Family;
- Lecture – Mineiro Institute of Water Management



Figure 29: Lecture- Mineiro Institute of Water Management.

- Lecture - II - AMWF - Alternative Mineral Waters Forum - Women's role in water resources management



Figure 30: Lecture Women's role in water resources management.

- **UNESCO International Water Conference - 13 and 14 May 2019**
Leveraging the trans-sectoral management of water resources for sustainable water security and peace



Figure 31: Participation in UNESCO International Water Conference



Figure 32: UNESCO International Water Conference.

- Lecture – Belo Horizonte - Brazil



Figure 33: Lecture Water and Gender.

- Waterlat – Chile



Figure 34: Participation in Waterlat – Chile



Figure 35: Participation in Waterlat – Chile

Lecture – ENCOB – Foz do Iguaçu - Brazil



Figure 36: Participation in ENCOB – Foz do Iguaçu - Brazil



Figure 37: Lecture in ENCOB – Foz do Iguaçu - Brazil

- **Webinar Participation: Management tools for the water sector in Latin America and the Caribbean to face COVID-19 (Thursday, April 2, 2020)**
- Evaluation of IHP-VIII, Members of the IHP Water Family - meeting at UNESCO Headquarters, Paris, in early 2020, to prepare the Consolidated draft Strategic Plan of IHP-IX.
- Submission of information to IHP regarding the Consolidated draft Strategic Plan of IHP-IX.
- Webinar Participation: Management tools for the water sector in Latin America and the Caribbean to face COVID-19 (Thursday, April 2, 2020)
- Participation in internal meeting of UNESCO Centers and Chairs related to water in Latin America and the Caribbean scheduled for May, July 29 at 4:00 pm in Montevideo
- participation in the open meeting of the centers and chairs where homage was paid to the memory of our colleague Joram Gil and the presentation of the new chairs and the new center. This meeting took place on August 4, 2020;

- Participation of the Informal meeting of the Members and Observers of the IHP Council where the open meeting of the centers and chairs took place on September 8 2020



Figure 38: Informal meeting IHP

- Participation of the coordinator in the cycle of Web seminars sequías en América Latina y el Caribe carried out by the CAZALAC center (center category 2 sponsored by UNESCO), and the UNESCO Intergubernamental Hydrological Program Secretariat, where Section 1- 16 sep 2020: “Causes de la sequias; section 2- 24 sep 2020: “which you previously registered for has been updated by the host”; section 3: 06 oct 2020 “The seasonal sequences in Central America and the case of Mexico. Occurrence, consequences, advances and strategies ” and section 4: 21 oct 2020 "The impact of the sequences has been and has been on the health of the inhabitants of Latin America and the Caribbean, affecting their health, economy, food and even social and political stability"
- Participation in the Gobernanza de Acuíferos Transfronterizos webinar cycle - Regional Course Latin America and the Caribbean, goals were to develop skills in government, promote international cooperation, and share experiences, study cases and lessons learned in Latin America and the Caribbean (LAC).
- Participation of the Water Education and Culture Working Group meeting on November 11, 2020.
- presentation as a pannelist in webinar gender and climate in America Latin America and the Caribbean: better data for improved adaptation strategies on November 24, 2020 (IHP-LAC)



Figure 39: Webinar gender and climate in America Latin America and the Caribbean

- Participation on 2nd Extraordinary IHP Council session on 30 November and 1 December 2020. The Extraordinary session shall allow UNESCO Member States and Water Family to share their views and comments on the current 2nd-order draft Strategic Plan for IHP's Ninth Phase
- Participation on virtual Information meeting for the IHP National Committees and Focal Points of Latin America and the Caribbean, Wednesday 16 December, within the framework of the discussion process of the IX IHP Phase, currently in a consultation period until 4th January 2021.
- **Craft soap manufacturing course: protection of water resources and assistance in combating the COVID-19 pandemic offered in May for the Latin American community with support from UNESCO and IHP-LAC**

The chair with the support of the (IHP) developed an extension course entitled The manufacture of handmade soap as a way to protect water resources and help fight the COVID pandemic. This 30-hour virtual course was conducted by a multidisciplinary team of doctors made up of 7 professors, 1 professor, and also 10 young students. The course was carried out through three modules: Hygiene, entrepreneurship and environment. So far, the course has been available for 2 classes with a total of 500 registrations, of these 103 people have received certificates, of which 86% are women residents of various Brazilian states and countries such as Honduras, Paraguay, Bolivia, Chile, Mexico, Ecuador, Colombia, Portugal, Peru.



Figure 40: Folder Craft soap manufacturing course

- 6th edition of Permanent sustainability forum of historical cities of Minas Gerais - Participation in the urban October 2020 of UN-HABITAT (Urban Circuit 2020 - Brazil Office)



Figure 41: Certificate ONU HABITAT

- Manifest Letter of the 5th Edition (Municipal planning) of the Sustainability Forum of Historic Cities of Minas Gerais – Participation in the Global Week to Action for SDGs – United Nations, action campaign Sustainable Development Goals, – 18-26 September.

<https://www.act4sdgs.org/partner/HISTORICCITIESMG>

<https://www.youtube.com/watch?v=sUeHcGfi1SA&feature=youtu.be>

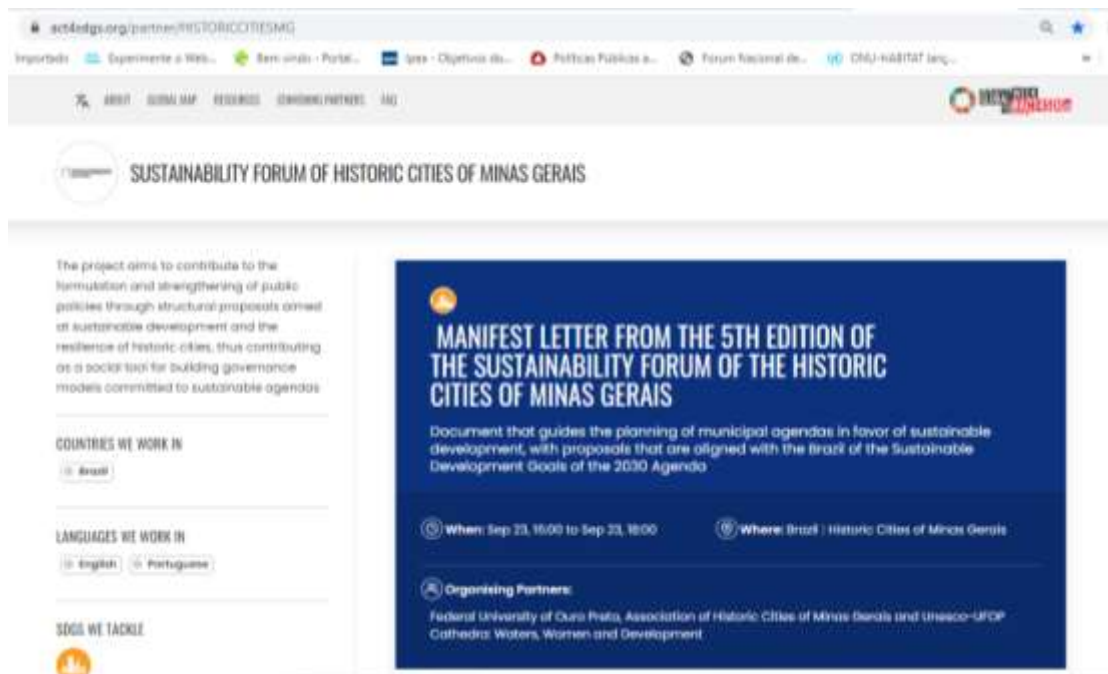


Figure 42: Manifest Letter

4. Communication/Knowledge Sharing (e.g. website/ platforms created or newsletters)

web: nucat.ufop.br

Revista científica:

<https://periodicos.ufop.br:8082/pp/index.php/alemur/issue/archive>



Figure 43: Magazine ok Nucat

Publications

COUTO, J., & COSTA, A.T., **Diagnosis of the performance of women graduated on the Geological Engineering course at UFOP.** In XXVII SEIC, UFOP Knowledge Meeting. Ouro Preto, 2019.

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LIMA, J. P., PEREIRA, A. L., REIS, P. L., BARBOSA, M. B., LIMA, A. C. S., SILVA, C. G. B., & COSTA, A. T. **Geoconservation applied to the development of the tourist potential of Serra de Capanema, MG.** In XXVII SEIC, UFOP Knowledge Meeting. Ouro Preto, 2019.

- REIS, P. L., MACIEL, A. S., & COSTA, A. T. **Environmental mapping and characterization of gullies and recharge areas in Santo Antônio do Leite district, Ouro Preto, MG.** In XXVII SEIC, UFOP Knowledge Meeting. Ouro Preto, 2019.
- FRIGUETTO, B. S., ARAUJO, M. C. S., COSTA, A. T., & MOREIRA, G. C., **Capture and monitoring the quality of public water supply in the city of Ouro Preto, MG** In XXVII SEIC, UFOP Knowledge Meeting. Ouro Preto, 2019.
- MOREIRA, G. C., FRIGUETTO, B.S., ASSUNÇÃO, P.H.S, LINS, F.C., ARAUJO, M.C.S., & COSTA, A.T. **Inventory of major elements and trace in the abstraction of drinking water consumption in the city of Ouro Preto, MG.** In Anais Southeast Geology Symposium, October 20-23, Campinas, p. 206. 2019.
- NETO, H.M.T., LIMA, A.C.S., COSTA, A. T.. **UFOP network of studies on the consequences of dam disruptions** In XXVII SEIC, UFOP Knowledge Meeting. Ouro Preto, 2019.
- ANDRADE, A.L.; CAVALCANTE, L.C.D; FABRIS, J.D.; PEREIRA, M.C.; ARDISSON, J.D.; PIZARRO, C. **Zeolite-magnetite composites to remove Hg²⁺ from water. Hyperfine Interactions,** (2019) 240:83.
- FELIX, A.L.; VIEIRA, P.C. et al. **Evaluation of basic sanitation conditions in locations with areas of social interest in the Ouro Preto city.** 30th Congress of the Brazilian Association of Sanitary and Environmental Engineering. ABES, Natal-RN, 2019.
- FELIX, A.L.; VIEIRA, P.C. et al. **Evaluation of basic sanitation conditions in areas of social interest in the Ouro Preto city: BAIRRO PADRE FARIA.** XXVII SEIC, UFOP Knowledge Meeting. Ouro Preto, 2019.
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5. Institutional changes/updates

The chair is currently linked to the School of Mines and its operation is by the NUCAT - UNESCO Chair Core - which currently consists of the following structure: General Coordinator, Vice-Coordinator and sub-coordinators of research, teaching and extension.

General Coordination: Prof. Dr. Adivane Terezinha Costa (Geologist Engineer)

Vice-Coordination: Prof. Dr. Angela Leão Andrade (Pharmaceutical)

Research Coordinator and Postgraduate: Professor Dr. Aníbal da Fonseca Santiago (Environmental Engineer)

Extension Coordination: Prof. Dr. Paulo de Castro Vieira (Sanitary Engineer)

Teaching Coordination: Prof. Dr. Kerley dos Santos Alves (Turismologist)

Emeritus Professor - Prof. Dr. Vera Lúcia Guarda (Pharmaceutical).

In addition, the Center features six additional teachers, one visiting teacher and two students as described below:

Prof. Dr. Ana Leticia Pilz de Castro (Sanitary and Environmental Engineer)

Prof. Dr. Aline de Araújo Nunes (Agricultural and Environmental Engineer)

Prof. Dr. Eleonice Moreira Santos (Chemistry)

Prof. Dr. Livia Cristina Pinto Dias (Environmental Engineer)

Prof. Ms. Maria Luiza Teofilo Gandini (Civil Engineer)

Prof. Dr. Carolina Machado Saraiva de Albuquerque Maranhão (Administration)

Prof. Dr. Cezarina de Souza. (Sanitary Engineer- Public Health)

Students: Juliana Fernandes Couto and Alana Lima (Geological Engineering)

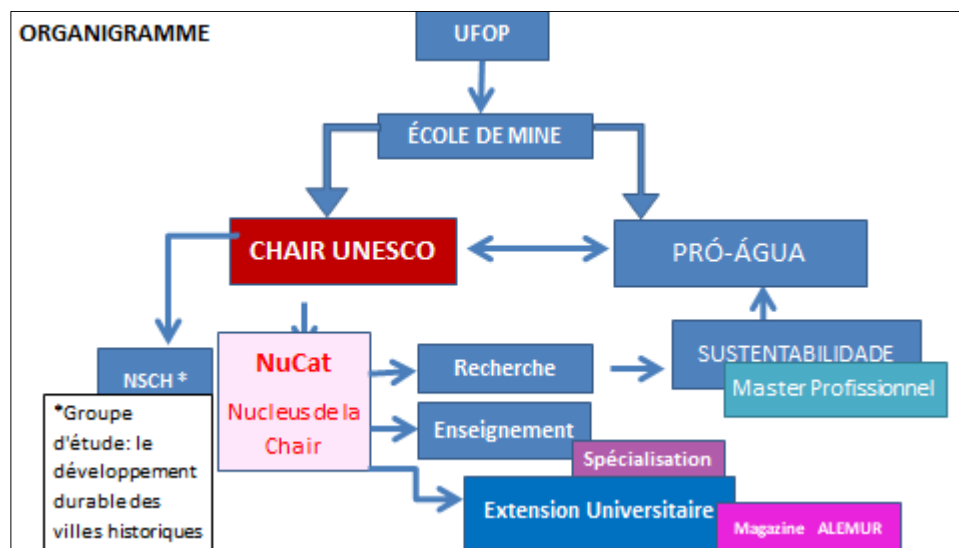


Figure 44: Operating structure of the Chair



Figure 45: Chair Members Meeting with Municipal Water Agency

6. Please provide examples of the Center / Chair's Main achievement(s)/success stories/best practices

The Magazine of the Chair: Beyond the Walls of the University - ALEMUR; 6 volumes edited

Collaboration in the Professional Master's Program – Environmental Socioeconomic Sustainability with the Water, Women and Development research line and the discipline water and gender; Environment and Health and Technologies in Environmental Sanitation research line and the discipline Urban Stormwater Management

Permanent sustainability forum of historical cities of Minas Gerais: In 2019, two editions were held, one in the city of *Ouro Preto* on July 11 and 12 (Sustainable development in the urban nucleus), with 270 participations, and another edition in the city of *Brumadinho* on the 24 and 25 October (Innovation and Inclusion), with approximately 150 participations in various activities.

The public participation of the 5th edition went from 2 thousand people in the live broadcasts, with the issuance of approximately 1096 certificates for representatives of different sectors (33% outside the academy), genders (66% female) and ages (35% of 25 35 years). These people participated on the internet in 131 Brazilian cities, located in 17 states, and 3 foreign countries - Uruguay, Paraguay and Spain. From Minas Gerais we had the participation of 68 cities, 26 of them being Historic Cities. The 6th edition was held in October 2020 with the theme "The objectives of sustainable development of Agenda 2030 in traditional communities". This edition had the honor of participating once again in the international circuit Urban October 2020 of UN-Habitat through the Urban Circuit 2020 of the Brazilian office of that entity. The first activity of this edition was the holding of a panel of debates with live transmission on the [UN-Habitat channel on YouTube](#), which had as its theme the relationship of the thematic guidelines of the objectives of sustainable development with the traditional communities of the state of Minas Gerais. It is estimated that the transmission of this panel of debates reached approximately 1,800 people, according to the statistics provided by the [UN-Habitat channel on YouTube](#). It is estimated that approximately 500 people accessed the activities developed during the sixth edition, according to the statistics of the Forum's official channel. These data are presented on the [6th edition wall](#) available on the [project's website](#).

NUNES, A.A. Coordination of the mini-course "Instruments for the prevention and control of urban floods", which was realized on July 12 at the **Permanent sustainability forum of historical cities of Minas Gerais**.

GUARDA, VLM. Coordination of the mini-course "Project's Elaboration", which was realized on OCTOBER 25 at the **Permanent sustainability forum of historical cities of Minas Gerais**, in Brumadinho, MG.

COSTA, A. T. Coordination of the mini-course "Water and Health coupled with agroecology which was realized on October 25 at the **Permanent sustainability forum of historical cities of Minas Gerais**, in Brumadinho, MG.



Figure 46: Coordination of New Line of research – Solid Residues and Gender with Lais Pacheco (Master Student) and Kerley Alves (co- Sponsor).

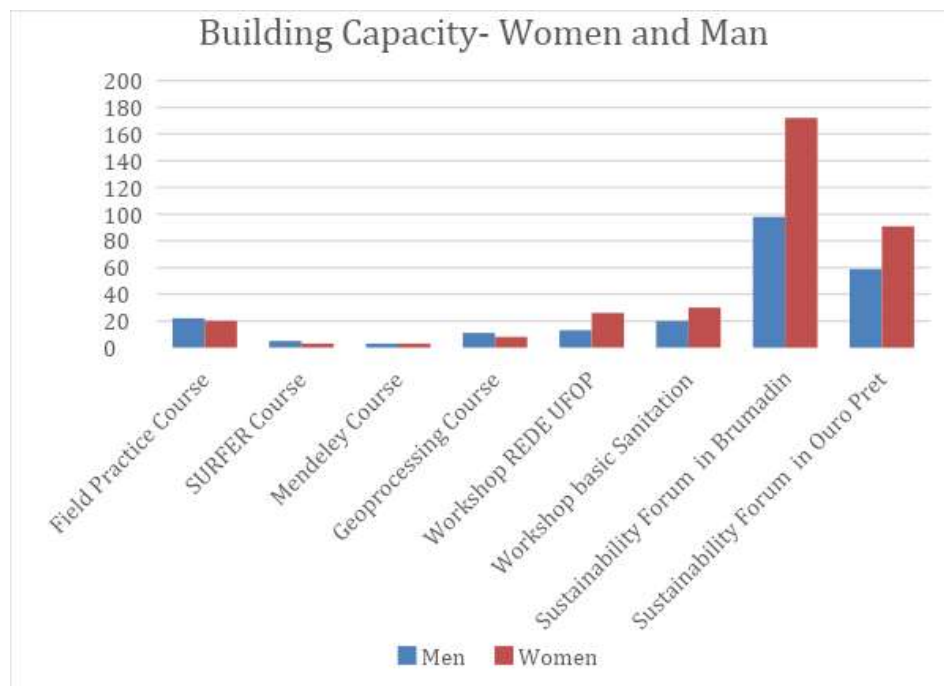


Figure 47: Number of men and women in training and events

- “Hidroweb portal” course: Access to the Hidroweb portal; manipulation of rain and water quality data and their applications in the urban context; manipulation of fluviometric data; construction of the permanence curve and its applications in the urban context; access to

Hydro platform. This 30-hour virtual course was conducted by 2 professors and 17 young students participated.

- Booklet Practical tips on sustainable sanitation for the pandemic period and beyond - We need to redouble our daily care.
- **Craft soap manufacturing course: protection of water resources and assistance in combating the COVID-19 pandemic offered in May for the Latin American community with support from UNESCO and IHP-LAC**

The chair with the support of the (IHP) developed an extension course entitled The manufacture of handmade soap as a way to protect water resources and help fight the COVID pandemic. This 30-hour virtual course was conducted by a multidisciplinary team of doctors made up of 7 professors, 1 professor, and also 10 young students. The course was carried out through three modules: Hygiene, entrepreneurship and environment. So far, the course has been available for 2 classes with a total of 500 registrations, of these 103 people have received certificates, of which 86% are women residents of various Brazilian states and countries such as Honduras, Paraguay, Bolivia, Chile, Mexico, Ecuador, Colombia, Portugal, Peru.



Figure 48: Handmade Soap Course in America Latin America and the Caribbean support HIP- Lac



Figure 49: Number of men and women in Handmade Soap Course.

7. Future activities that will contribute directly to IHP and/or to WWAP Activities in the framework of the SDGs (identify the SDG (target if possible) for which each activity contributes).

- Magazine ALEMUR – n. 7 and 8
- Permanent sustainability forum of historical cities of Minas Gerais state, 7th edition and 8th edition (SDG).
- Participation of the toolkit capacitation on 2021 (WWAP and IHP)
- water security course with participation from the network of IHP-LAC chairs
- Participatory water monitoring actions to begin in January 2021 with the support of UNESCO Brazil for the communities affected by the disaster of the rupture of the iron mining dam (SDG).