



RESIDENCY IN SCIENCE, TECHNOLOGY AND SOCIETY (CTS)
HABITAT, AGROECOLOGY, SOLIDARITY ECONOMY AND ECO-SYSTEMIC
HEALTH: INTEGRATING POSTGRADUATE AND EXTENSION

Andrade . Neder . Tostes . Wiesinieski . Aureliano . Pazos (Orgs.)



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Brasília, 2023

Liza Maria Souza de Andrade | Ricardo Toledo Neder
Simone Parrela Tostes | Livia Barros Wiesinieski
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2023

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PRESENTATION

This book aims to present the fundamentals and the basis of the multi professional course in CTS - Science, Technology, and Society in residency (Lato Sensu Graduation + Extension), characterized by a pedagogical practice and educational planning type PEX - research associated with teaching and integrated with extension. The proposal socially and territorially articulates three interdisciplinary themes: Habitat (Housing, Architecture, Urbanism, and Environment in the Countryside and the City); Agroecology (Food Sovereignty, Family Farm, Field, and City Integration); Health (Epidemiological Surveillance, Collective Health, Family Health, Sanitation, Ecosanitation, and Ecological Infrastructure) and a fourth transdisciplinary theme: Associated Work (Solidarity Economy, Training and Education, Occupation, Income, and Solidarity Technology).

The contents of the chapters were developed in the discipline of Special Studies in Technology, Environment, and Sustainability of the Graduate Program of the Faculty of Architecture and Urbanism of the University of Brasília (PPG-FAU/UnB), offered in 2021, integrated into the Extension Course Fundamentals in Science Technology and Society (CTS) - Habitat, Agroecology, Solidarity Economics, and Ecosystem Health, a partnership of the Science Policy Center, Technology and Society (NPCTS/CEAM/UnB) and professors of the Faculty of Architecture and Urbanism (PPG-FAU), the Faculty of Planaltina (FUP), the Faculty of Agriculture and Veterinary Medicine (FAV) and CDS/UnB, the Collective Health course of the Faculty of Ceilândia (FCE), the Faculty of Education (FE) and the Institute of Humanities (IH).

Thus, the process of construction of the Multiprofessional Residency CTS was initiated to form a transdisciplinary epistemological base in Solidarity Technoscience, inserting the University Extension in graduation studies, integrating 15 master's and doctoral students to more than 50 people from social movements, collectives, professional entities, government technicians, researchers and professors from other institutions as well as undergraduate students. The students were organized into working groups in the online meetings by the Teams platform, through which the following themes were discussed: i) solidarity technology, sociotechnical adequacy, and solidarity economy; ii) Freirean education and work; iii) territorial connections, social struggles and networks of solidarity; iv) sociotechnical adequacy for habitat production: spatial patterns in the field and the city; v) sociotechnical adequacy for agroecology and urban agriculture; and vi) ecosystem

health, sanitation, and governance, which make up the contents of the chapters of this book.

In the introductory chapter, it is detailed how the methodological process of structuring the course took place, divided into two parts: 1) theoretical-methodological foundations based on Solidarity Technoscience, forms of Technical Assistance, and the University Extension; and 2) political-pedagogical proposal of the course, including the themes, the territories surrounding the Distrito Federal that will be worked on the course, the curriculum matrix and the general functioning. Then Finally, the expected results and the developments already in progress are discussed.

The essence of the Residency consists in uniting Graduation And Extension in a trans-multi-interdisciplinary character with the vision of university public policy (opposite that of private or official philanthropy) offering vacancies for 35 trans-multi-disciplinary technical agents (managers, urban architects, lawyers, economists, sociologists, social workers, technicians, and engineers, community health agents), of which 28 will receive scholarships, and 14 territorial agents (2 agents from each of the 7 territories of the Distrito Federal and surrounding areas) able to act as multipliers of community initiatives, to provide sociotechnical advice to local entities and to articulate resources, people, entities, tools, and territorial tactics in seven territories surrounding the Distrito Federal in favor of the protagonism of subjects and groups in their daily territories.

The Lato Ssensu Course and the Multiprofessional Residency Extension Program CTS – Habitat, Agroecology, Ecosystem Health, and Solidarity Health (linked to PPG-FAU/UnB and the Extension Decanery – DEX/UnB) are being sponsored by the 2021 ATHIS Notice of the Council of Architecture and Urbanism of Brazil (CAU/BR¹) and with the parliamentary amendment of Mrs. Erika Kokay, directed to the payment of scholarships.

It also has the support of research and extensionist practices carried out by the Research and Peripheral Extension Group, emerging works within the matter of the project “Habitat production in the territory of DF and surroundings: urban and rural ecosystems and sociotechnical advice”, coordinated by Professor Liza Andrade, with drone images produced by engineer Valmor Pazos Filho, as well as with project “Digital Platform Cooperativism (prototype for seven territories of the Distrito Federal), mapping of actors, agencies and sociotechnical adequacy in rural and urban territories of production of the popular circuits of the economy – a CTS approach”, coordinated by Professor Ricardo Neder. Both projects are funded by the Distrito Federal Research Support Fund (FAP-DF).

Support was received from research and experiences of the Agroecology Center of

UnB, coordinated by Professor Flaviane Canavesi, of the Ecoplanetary project, coordinated by Professor Aldira Dominguez, and the Life and Water project in ARIS, coordinated by Professor Perci Coelho.

The list of modules below has the respective module: professors-coordinators and doctoral tutors of ppg/FAU/UnB of the Fundamentals extension course in science, technology and society (CTS) – Habitat, Agroecology, Solidarity Economy and Ecosystem Health.

-Solidarity technology, sociotechnical adequacy and solidarity economy - Professor Dr. Ricardo Toledo Neder - FUP/UnB; Tutor - Lívia Cristina Barros da Silva Wiesinieski;

-Freirean education and work - Professor Dr. Raquel de Almeida Moraes - FE/UnB; Tutor - Ana Luiza Aureliano Silva;

-Territorial connections, social struggles and solidarity networks - Professor Dr. Perci Coelho de Souza - IH/UnB; Tutor - Letícia Miguel Teixeira;

-Sociotechnical adequacy for habitat production: spatial patterns in the countryside and in the city - Professor Dr. Liza Maria Souza de Andrade - FAU/UnB; Tutor - Juliette Anna Fanny Lenoir;

-Sociotechnical adequacy for agroecology and urban agriculture - Professor Dr. Flaviane Canavesi - FAV/UnB; Tutor - Natalia da Silva Lemos;

-Ecosystem health, sanitation and governance - Professor Dr. Aldira Guimarães Duarte Dominguez - FCE/UnB; Tutor - Diogo Isao Santos Sakai; and

-Technical Support - Valmor Cerqueira Pazos - FAU/UnB - master's account FE/UnB.

¹<https://www.caubr.gov.br/athis-edital/>

The course has the partnership of the Nucleation of Residency AU+E UFBA/UnB, the BrCidades Network, the Housing-Advisory Network, the MST, MTST, Fiocruz, Oca do Sol and the following associations in the territories:

- Association of Powerful Women of Santa Luzia - Estrutural City/DF;
- Association of Residents of Santa Luzia - Estrutural City/ DF;
- Association of Residents, Fighters and Supporters of Dorothy Stang Residential - ARIS Dorothy Stang - Sobradinho / DF;
- Nature House in the Sol Nacente- ARIS Sol Nascente - Ceilândia/DF;
- ASPRAFES - Association of Farmers and Farmers FA - Small Rural Settlement William - MST - Planaltina/DF;
- APRACOA - Association of Rural and Artisanal Producers of The Oziel III Settlement - Pipiripau - Planaltina/DF;
- COOPERCARAJÁS - Carajás Agroecological Production and Marketing Cooperative - Brasília/DF;
- Quilombo Mesquita Renovating Association - Quilombo Mesquita - Western City/GO;
- Preserves Serrinha - REDE Association of Preservation and Sustainable Development of Serrinha do Paranoá - Paranoá/ DF; and
- National Coordination of MTST (working in Nova Planaltina - DF) and Coletivo Negro Raiz

SUMMARY

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INTRODUCTION¹

Liza Maria Souza de Andrade, Ricardo Toledo Neder,
Simone Parrela Tostes, Livia Cristina Barros da Silva Wiesinieksi

The expansion of higher education observed in Brazil in the first decades of the 21st century takes place in a contradictory socioeconomic situation, inseparable from the characteristics of the country's insertion in the capitalist world system. As in other peripheral countries, the selective and unequal presence of modernizing vectors from the country and abroad is at the basis of the enormous socioeconomic and spatial disparities that characterize Brazilian society (and which are proper to capitalist social formation).

Thus, on the one hand, we see a high degree of development of private and state business productive forms and their technoscientific foundation, concomitant with the growth of poverty. Hence, in this second decade of the 21st century, we have the exclusion of 110 million Brazilians from the workforce employed in the formal sectors.

This exclusion is translated into the organization of the territory, which develops in close connection with the dynamics of capital in its various reconfigurations. The urbanization process is emblematic of this link and has been a determinant in the spatialization of socioeconomic inequalities in the country. This situation makes solutions based on the expansion of these same productive forms (labor-intensive and labor-saving capital) in their economic and socio-spatial dimensions unviable.

The solutions are in double concertation. The university will participate as it has been since the 1930s, in training staff to guide state investments and resources to overcome the delay and recover, even partially, the levels of employment and salary for the skilled unemployed contingents (in 2021, there were 15 million in an economically active population of 30 million). On the other front, the university's technoscientific production does not leverage solutions for the 110 million people who boost the popular circuits of the economy – "Uberized (autonomous drivers)", self-employed, women in family domestic work, domestic workers, traditional and indigenous populations.

Between these two dynamic layers of the labor force in Brazil, we are compared the systole-diastole movement of a considerable part of 15 to 20 million Brazilians in a situation of pauperism and accelerated impoverishment (FOLHA DE SÃO PAULO, 2022); a segment that was before 2016 assisted by the tripod Bolsa-Família / Network SUS / Family

Health / Public Education. These distributive income policies have been replaced today by Emergency Assistance under neoliberal management guidance.

This scenario directly questions the Brazilian university and directs centrality and urgency to debates and initiatives that allow it to critically reorient its role and contribution towards a fairer and egalitarian society.

The proposal of Multiprofessional Residency in CTS (Science, Technology, and Society – Habitat, Agroecology, Solidarity Economy and Health) is a joint initiative of the Graduation Program of the Faculty of Architecture and Urbanism of the University of Brasília (PPG-FAU/UnB) and the Center for Advanced Multidisciplinary Studies of the same institution.

The residence aims to simultaneously train technical agents and territorial agents able to act as multipliers of initiatives Distrito Federal led by subjects, groups and communities of seven territories surrounding the DF in the formulation of microprojects and local programs. It is a proposal that unites *latu sensu* post-graduation and extension and relates to areas of social demands for sociotechnical and technological advice, articulating resources, people, entities, tools and territorial tactics.

In the environments of the circuits of the popular economy, there is no traditional legal, fiscal, financial and banking certainty; however, the work and the provision of services and exchanges take place frankly, and even credit is shared by bonds of neighborhood, custom and habit of loaning and friendship. This orientation is shared by the Brazilian experiences of creating microprojects demanded by groups and neighbors community in ordinary neighborhoods to access currency and social resources through community development banks.

In popular territories, the right to the city and the right to housing is equivalent to the creation of the right to social technology understood as a domain of self-managed forms of production through the associated work of communities. In the city, under the historical characteristics of the so-called self-construction and its organizational forms, this domain of the productive cycle over the sociotechnical conditions of organization of leaders, social and popular movements, can be promoted by semi-structured projects of teaching-research-extension in the format of Multiprofessional Residence.

One of the main guidelines that guide the political-pedagogical project of the residence refers to the inclusion of other knowledge and tactics to contribute to the construction of collective and solidary knowledge. This inclusion allows the development of methods, processes, and techniques that contribute to the equating of social problems and mediating social and environmental conflicts in the struggle for the essential rights

¹Adapted text. Original text published in the Proceedings of the VII ENANPARQ, Axis 7: 'Extensionist Practices,' titled: Residence in Science, Technology, and Society - CTS - Habitat, Agroecology, Solidarity Economy, and Ecosystemic Health: Why Integrate Graduate Studies into Extension?"

of populations excluded from the process of planning the territory, which by resistance practices configure new typologies of urban and rural occupations to be incorporated in the shared construction of local intervention projects.

THEORETICAL AND METHODOLOGICAL FOUNDATIONS

Solidarity Technoscience

Latin American Thought in Science, Technology and Society (PLACTS) criticizes the conception of technology as applied and neutral science and promotes popular participation with other knowledge. It is based on a certain transdisciplinary conceptualization of internal and external epistemological and extra scientific convergences to the major areas of science (NEDER; MORAIS, 2017). In Ibero-American countries, this contemporary trend of review on the social constructivism of technology is known as the Science Technology and Society (CTS) movement.

Observing the ineffectiveness of social and political solutions established to combat inequality and discrimination, sociologist Boaventura de Sousa Santos (2020) advocates a policy capable of escaping the determinations of technoscience/technosciences defined by scientific and technological agendas from central countries in the Northern Hemisphere (basically the United States of America, England, France, and Germany), which include, at the same time, the definition of labor requirements, project development, technical codes and expertise to be employed by business networks and technology chains consolidated in the central countries (BAGATOLLI and BRANDÃO, 2021).

This model tends to benefit only the professional layers best situated in the structure of income and distribution of wealth, with more opportunities for technological, managerial and formal employment training. This structure favors only marginally or subordinately the broader social segments of Brazilian society, which make up 2/3 of the workforce and which are precisely those that most need this policy.

In the view of authors working with CTS studies and PLACTS, social technology emerged in 2004/2016 to expand the mobilization of social movements, unions, public companies and the media in general (NEDER, 2016). Considering the high interdependence between technology and conditions of socioeconomic life and political organization today,

if the previous definitions in the technological project do not provide for the forms of social inclusion of people, groups and social classes, technology generates conditions of exclusion (NEDER; MORAES, 2017).

Unlike conventional technology, developed for or by companies in the capitalist logic of satisfying demands previously identified with a view to profit, social technology is carried out by people, groups, cooperatives, associations, and community collectives not contemplated by conventional technology or in by situations that involve or propitiate its conception (DAGNINO, 2014).

In questioning the neutrality of science and technological determinism, Dagnino (2019) advanced with the understanding of the concepts of Social Technology and Solidarity Economy and elaborated the concept of Solidarity Technoscience to designate the action of a collective of producers that organizes itself to carry out a work process in which socioeconomic context engenders solutions directed to the collective ownership of the means of production. These forms of resistance come from a social agreement (which legitimizes work with collaborations), which influences the productive environment, either aiming at a control (self-management), or under a cooperation (of participatory voluntary type). This process causes a change in the generated product, which the material gain may be appropriate according to the decision of the collective of a solidarity enterprise (DAGNINO, 2019).

The Forms of Assistance/Technical Advice in the Residency Project

According to the Rio de Janeiro Charter "All worlds, one world, Architecture-City 21", of the 27th World Congress of Architects (UIA2021RIO), assistance and technical advice for housing of social interest "should be considered as a public service, permanent and accessible to all society, valuing the possibilities of intersectoral articulation and integral action on the various aspects of reality". It also emphasizes that "the technical knowledge of architects and urban planners must dialogue and share with the popular knowledge of the various agents working in the territory", taking into account the reduction of poverty and the strengthening of democratic, shared, and participatory management.

Generally, the forms of assistance/technical advice are based on a very short project preparation time (one to two years maximum). Both for researchers and for community agents and social actors, the traditional annual notices of "projects" financed, with a short time horizon, generally annualized in the contents, are not enough.

It is also worth remembering that, even with participatory proposals, technical assistance commonly acquires a one-way character (one-way), revealing itself to be centralized in the official issuing institutions (university, Sesi, Senar, Senac, Federal C&T Institutes, schools, municipal and state departments, government programs and private companies). For popular groups (receivers) of urban peripheries and rural areas, in general, technicians, scientists, and researchers who act in this way prioritize a technological and pedagogical approach totally inadequate to the needs of communities (MOLINA et al., 2014).

Therefore, the CTS Residency adopts the Modality of Decentralized Participatory Technical Assistance (ATPD), which has a heuristic approach: we can only advance if researchers who are late will integrate with the holders of technical solutions. Hence, we have to elaborate critical paths (specific heuristics) that take into account popular reactions through methods of listening to local knowledge and practices of resistance (creators of counter-hegemonic power/knowledge). Its decentralized (extensionist) character lies in the fact that the participatory knowledge generated predicts, as a strategic component, that knowledge will be decentralized back with the enriching sociotechnical elements for the communities involved.

This decentralized turning back or returning path of knowledge, in the case of ATPD methods, can only be operationalized by the relevant community-based groups or transversal movements that will work the feedback as part of the individualization of popular groups (taking into account their characteristics such as history, culture, language, myths and facts of local identity).

In addition, new practices under the ATPD modality that assume links and roots with the territory have highlighted the role of training and practices of “relevant groups” to be integrated into a residency process. These groups can be masons and masters of works, artisan workers, agroecological producers, freelancers specialized in transport and change; electricians, mechanics, internet network technicians, etc.

They bear the sociotechnical demands of the community. Its interventions in the territory introduce ways of coping with cognitive power in technological devices generally used by private and state-owned companies against communities. A relevant group, when it becomes subject to resistance and self-management practices in the issues of habitat, community economy, food and agriculture, or also in health as an environment, integrates with networks in the territory and generates learning practices related to education and work, housing, food and production, body and health.

Law No. 11,888 of December 24th, 2008, foresees providing low-income families with free public technical assistance since the design and construction of housing for

social interest. However, the demands of the population from 0 to 3 minimum wages, the target audience of that law, focuses not only on the qualification of housing but also on the provision and qualification of a series of collective equipment and free spaces that will bring improvements to the place of life of these populations, having a more systemic effect on these territories, besides being spaces that catalyze opportunities for professionalization, generation of culture, employment, and income, with a view to community emancipation.

Thus, the technical assistance/advice in housing for social interest to be addressed in the course also includes processes and methodologies of design and intervention in actions in the territory through the articulation of a range of interrelated aspects, according to the experiences of the extension research groups, namely:

i) the development of research in technical assistance on themes still peripheral and marginalized within the academic system related to the production of space in the field and in the city (Urban and Agrarian Reform) from a multiprofessional dialogue and collaboration; and

ii) new processes and methodologies of design and intervention, integrating them in the form of action research (THIOLLENT, 2011) through active methodologies and social mobilization with a transdisciplinary and trans-proportional vision based on Environmental Sustainability, Social Technology and the participation and autonomy of subjects, covering territories and groups linked to popular movements, urban and periurban communities, communities on the outskirts, residents' associations, environmental entities, as well as peasant communities and traditional communities.

The University's Extension

The political-pedagogical project of the residence is based on two central points linked to the demands of higher teaching:

In the foreground, extension is key; but without continuity, there is no transformation. A key component is anchored in the extension policy resolution of the National Council of Education no. 07 of December 18, 2018, which states that:

the extension in Brazilian Higher-Education is the activity that integrates with the curriculum matrix and the organization of research, constituting an interdisciplinary, political educational, cultural, scientific, technological process, which promotes the transformative interaction between higher education institutions and other sectors of society, through the production and application of knowledge, in permanent articulation with teaching and research.

In the scope of residence, the University's Extension integrated into academic research represents a possibility of reconstruction of scientific knowledge from the transposition of the university walls with the inclusion of other knowledge that is revealed to be power/knowledge (potential) to influence the resolution of problems. The response time of extension researchers, community agents, and social actors in the territory, however, is qualitatively different. Extensionists sensitize and seek to integrate agents and social actors, but they cannot follow these transformations over a long time.

Then, the residence finds a safe haven in the territory through the extension. The second fundamental component of this political-pedagogical project seeks to carry out the extension as an in-residence program. To adopt a response to the new forms of multi-professional residence, the residence has transcended its provenance in the oldest field of medicine to express itself as the training of residents or professionals living in the territories. With this, there is a potential increase in the capacity of the university to generate forms of technical advice (under *modus operandi* itself in Architecture and Urbanism, Agrarian Sciences/Agroecology, Anthropology and Sociology, Public Management, Social Psychology, and Law). These hybrid modalities of Extension+Residence are conducive to the creation of a dialogical field influenced by popular social movements and their own civil society organizations (associations, cooperatives), having as reference the new Regulatory Framework of Civil Society Organizations (MROSC) (BRASIL, 2016). Through the Regulatory Framework, forms of cooperation between the State and community entities were based on extension and residence practices, in which the Decentralized Participatory Technical Assistance (ATPD) and the Technical Assistance in Housing of Social Interest (BRASIL, 2008) assume a relevant role.

It is also worth mentioning that residency responds to the need for training of professionals in themes of urban pedagogy, in which the improvement of participatory processes of listening, social learning, and the strengthening of community autonomy is relevant.

Integration and transversality of knowledge for sustainable development

The integrative and multi-trans-interdisciplinary nature of the residency proposal is based on collective and collaborative work and on the integrated and transversal approach of various fields of knowledge in interaction with popular knowledge from the perspective of Social Technology, contributing to the expansion of the contexts of professional activity and to the enhancement of the social and civic citizen responsibility of the university.

The course also aligns with the UN document (2020) "Shared Responsibility, Global Solidarity: Responding to the Socio-Economic Impacts of COVID-19", which recognizes the need to seize the opportunity of this crisis to strengthen countries' commitment to implement the 2030 Agenda and the 17 Sustainable Development Goals (SDGs) to achieve a more inclusive and sustainable future.

The family's loss of income in the circumstances of the pandemic will aggravate the vulnerability of various segments of society, leading them to the poverty line. All inhabitants must have access to livelihoods and a place to live with dignity, according to Articles 5 and 6 of the Federal Constitution of Brazil (BRASIL, 1988), which includes housing among the basic vital needs that must be met by the minimum wage.

In this context, we need the 17 SDDs, more and better health systems, fewer people living in extreme poverty, less gender inequality, a healthier natural environment, and more resilient societies. The residency course directly addresses the following sustainable development objectives:

SDGs 1 (poverty reduction) and SDGs 10 (reducing inequalities)

Through professional training and territorial agents in the theme "associated work" (solidarity economy/training and education/occupation/income and solidarity technology); in the vulnerable territories or in the environments of the circuits of the popular economy there is no traditional legal, fiscal, financial and banking security, but the work and the provision of services and exchanges take place frankly, and even credit is shared by bonds of neighborhood, custom, and habit of loan partnership and friendship, as already evidenced earlier.



This orientation is shared by the Brazilian experiences of creating micro-projects demanded by groups and communities of neighbors in ordinary neighborhoods to access currency and social resources through community development banks. In already advanced experiences (in the last 15 years), and under pre-incubation environments in microcredit, legal, commercial, and economic assistance, as well as experiences of community creation of Rotary Solidarity Funds (such as popular self-financing schemes), this tool empowers local groups to demand cash to support the density of local programs.

Solidarity credit allows guiding local inversions to improve the conditions of social and economic survival in the midst of adverse labor market conditions under the financialization of capital. This financialization does not have practical solutions for 2/3 of the real community and popular economy, due to technology increasingly intensely incorporated into products and production processes, since this results in the dismissal of growing contingents of salaried workers. In addition to these aspects, the course provides for affirmative actions that are expressed through the direct participation and in all stages of 14 territorial agents whose activities will take place in the 7 territories surrounding the Distrito Federal: 1) Planaltina - Pequeno William Settlement / New Settlement Petrópolis; 2) Planaltina - Settlement Oziel III; 3) Sobradinho - ARIS Dorothy Stang, 4) Paranoá/Serrinha do Paranoá 5) Ceilândia - ARIS Sol Nascente, 6) Cidade Estrutural/Ocupação Santa Luzia; 7) Surroundings of Brasília - Quilombo Mesquita borders DF /GO-Western City of extreme income vulnerability, poor housing, infrastructure, health, etc.

The integration between professionals and community agents forms a set of interventions aimed at improving the built environment, sanitation solutions, housing and construction improvements, and training in occupation, work, and income (OTR), addressed from the perspective of the leading role of individuals and groups of residents in the consolidation and valorization of their daily territories. The collective and shared construction of local intervention projects based on participatory and solidarity techniques, methods, and processes contributes to addressing social problems and mediating social and environmental conflicts common to populations excluded from conventional land planning processes. This set of actions seeks to contribute to the realization of the right to housing and the right to the city of the communities surrounding the Distrito Federal, seeking to contribute to the commitment to reduce inequalities and promote the rights of vulnerable populations.

10 REDUCED INEQUALITIES



SDGs 3 (good health and well-being)

The Ottawa Letter of 1986 for “Healthy Cities” (BRASIL, 2002, p. 19) emphasizes the systemic function of health, which cannot be dissociated from other public policies, and should be conquered with social participation and preservation of the environment.

The positive concept of health makes it the responsibility of other areas at the global level and goes beyond the health sector: the basic prerequisites for ecosystem health are peace, housing, education, food, income, a stable ecosystem, sustainable resources, social justice, and equity. Those who live in informal settlements, densely populated slums, and other precarious territories, without access to adequate housing, basic sanitation services, employment, and income, and, consequently, in situations of food insecurity and social vulnerability, have also compromised the conditions of good health.

Thus, actions that promote improvement in the general conditions of the built environment focus directly and positively on good health, which allows us to affirm that the matter of this proposal, as detailed in the specific objectives, includes SDS 3.

3 GOOD HEALTH AND WELL-BEING



SDGs 5 (gender equality)

The residence has as its proposal to be a decentralized participatory type of assistance, which has popular and community participation through methods of listening to local knowledge and practices of resistance (creators of counter-hegemonic power/knowledge with regard to issues of gender, ethnicity, and culture) that, by welcoming groups and non-majority communities, simultaneously encourages their participation and enhances the understanding and fulfillment of their specific demands. Its gender equality character lies in the fact that the participatory knowledge generated predicts as a strategic component the valorization and organization of local knowledge and initiatives, and that these will be valued with the enriching sociotechnical elements for the communities involved.

Team experiences, such as the work "The inhabiting of powerful women: sustainable and supportive community", in the Santa Luzia sector of the Estrutural City, in DF, is an example of the participatory approach and gender equality in the project processes, in compliance with SDG5.



SDGs 6 (clean water and sanitation)

"Ensure the availability and sustainable management of water and sanitation for anyone and everyone." The course directly and specifically addresses the training in projects focused on water and sanitation from the perspective of Water Sensitive Cities, in which the Peripheral group has been working on socio-technical sociotechnical assistance projects for ecological sanitation.

An area devoid of water infrastructure, such as informal settlements, when compared to a city with its traditional gray infrastructure, has a greater potential to become faster and directly environmentally sustainable and sensitive to water in a process called "leapfrogging", which means the possibility of implementing a given stage without the process going through all the previous stages of development.

In this case, the ecological infrastructure of drainage, sanitation, and reuse of water from nature-based solutions (SbN), ecologically more appropriate and advanced than the traditional gray structure, has greater potential to be implemented, reducing the problems suffered by the territories."



SDGs 11 (sustainable cities and communities)

“Making cities and human settlements inclusive, safe, resilient and sustainable.” SDS 11 is attentive to inclusive and sustainable urbanization; the planning and management capabilities of participatory, integrated, and sustainable human settlements, as well as efforts to protect and safeguard natural heritage; reduction of negative environmental impacts per capita of cities in particular to municipal waste management.

This SDG is aligned with the general guidelines of the City Statute (article 20(I) to guarantee the right to sustainable cities, such as the right to urban land, housing, environmental sanitation, urban infrastructure, transportation and public services, work, and leisure, for present and future generations. In its XIV item, the City Statute deals with land regularization and urbanization of

areas occupied by the low-income population through the establishment of special standards of urbanization, land use, and occupation and building, considering the socioeconomic situation of the population and environmental standards.

The SO11 is aligned with the goals of the New Urban Agenda, agreed in October 2016, during the III United Nations Conference on Housing and Sustainable Urban Development, including ensuring access for all to safe, adequate, and affordable housing, as well as basic services and slum urbanization. The project of the residence intends to contribute to the process of land regularization in the formal territories of the Distrito Federal and surrounding areas, thus attending to SO 11.”

11 SUSTAINABLE CITIES AND COMMUNITIES



THE PROPOSAL OF THE RESIDENCY COURSE

Background: the discipline of Graduation Studies and the Extension Course

The discipline “Fundamentals in Science, Technology, and Society (CTS) – Habitat, Agroecology, Solidarity Economy and Ecosystem Health”, offered from March to June 2021, was created to form a transdisciplinary epistemological base in Solidarity Technoscience to include university extension in graduation studies through a multi-professional multiprofessional residency project CTS/UnB, a partnership of the Science Policy Center, Technology and Society (NPCTS/CEAM/UnB) and professors from the Faculty of Architecture and Urbanism/PPG-FAU, the Faculty of Planaltina/FUP, the Faculty of Agriculture and Veterinary Medicine/FAV and CDS/UnB, the Collective Health course of the Faculty of Ceilândia - FCE, the Faculty of Education/FE and the Institute of Humanities/IH.

We chose to integrate the participants of the extension course with the students of the Graduation Program in work groups and online meetings through by the Teams platform, where the following themes were discussed: i) solidarity technology, sociotechnical adequacy, and solidarity economy; ii) Freirean education and work; iii) territorial connections, social struggles and networks of solidarity; iv) sociotechnical adequacy for habitat production: spatial patterns in the field and in the city; v) sociotechnical adequacy for agroecology and urban agriculture; and vi) ecosystem health, sanitation, and governance. Meetings of the working groups of each of the themes were organized.

Initially, 40 vacancies were offered by the registration systems (students and external community) of UnB, matriculaweb, and SiGAA, respectively. Due to the great demand, it was necessary to expand the offer of vacancies, and the course began on March 3, 2021, with 55 registered. On June 2, 2021, meetings with 53 concluded, representing the Southeast, Midwest, and Northeast macroregions, closed.

From the exchanges made in the working groups and in the classes taught by the teachers, 6 chapters were systematized for this book from the structuring axis of the course. The first chapter, called “Fundamentals in Solidarity Technoscience, sociotechnical adequacy and solidarity economy”, aimed to reflect on the solidarity economy from the theoretical framework and the history of public policies aimed at the promotion and inclusion of informal workers. This group of workers had its socioeconomic context strongly affected by the covid-19 pandemic and by the lack of support and efficient public policies of the Federal Government.

This chapter was organized into the following sections: introduction;

comprehensive framework of public policy for solidarity economy in Brazil (period 2004-2016); the framework of the solidarity economy movement in Brazil (1990-2017); analytical view on the relations between solidarity technoscience and solidarity economy: structuring issues – presenting a proposal for analytical consolidation of understanding about how solidarity economy operates in relation to the methodology of research-extension and teaching for sociotechnical adequacy in the context of the popular economy in Brazil and its subordination relations to the State and the formal sector of capitalist companies; a glossary of practical terms and concepts, which will facilitate the teaching and learning process of the CTS Residency; and bibliographic sections, with references such as “Small library of self-management, solidarity economy, and solidarity technology”.

The format adopted in this chapter differs from the other ones by occupying the role of leading and integrating knowledge. Thus, for the following sections, another structure was adopted, capable of reflecting the dialogues and presenting the good practices known and/or experienced by the members of the groups.

Table 1 presents the synthesis of the content collectively produced by the other thematic notebooks/axis from local and academic knowledge.

Thematic axes / Contributions	Fundamentals	Procedures	Good practices
Freirean education and work culture	Education as a practice of freedom Vs Banking education (FREIRE, 1987); Educator who “thinks right” (FREIRE, 1996, p.30); Partnership between university and society (DAGNINO, 2020); and Solidarity economy as a tool for awareness and empowerment (DAGNINO, 2014).	For the organization and structuring of the chapter, we used google docs platform, exchanges through social media, online meetings and conversation circles, ensuring “dialogicity” along the route. Bibliographic and documentary research.	(a) Lead Community - Poconé - Mato Grosso; (b) Peripheral Group and urban pedagogy; (c) EJA within the Freirian principles.
Territorial connections, social struggles, mobilization and solidarity networks	Region concentrated as a space of social relations (SANTOS, 1999); Informational reach and the subjects-networks (SOUZA, 2006); Solidarity technology (DAGNINO, 2019); and Pedagogical and socio-technical interactionism (NEDER, 2013).	Preparation of form and identification of the subjects-networks and their social struggles, which were connected through social networks. Bibliographic and documentary research. Systematization and discussion of the results by the members of the working group.	Practices in ATHIS Araras: Jardim Esperança Association; Collective Territorial Term; Movement around the recovery of Ribeirão Sobradinho; Occupation CCBB Resists; Technical Assistance for Housing of Social Interest; Nzinga Institute of Studies of Capoeira Angola and Banto Educational Traditions.

Thematic axes / Contributions	Fundamentals	Procedures	Good practices
Socio-technical adequacy for habitat production	Sociotechnical Adequacy AST (DAGNINO, 2019); Solidarity Economy (DAGNINO, 2019); Solidarity technology (DAGNINO, 2019); Freireana Pedagogy (FREIRE, 1970); Space use value (LEFEBVRE, 1968); and Space as a social product (LEFEBVRE, 1968).	Synchronous remote encounters with online lectures from invited teachers. Synchronous remote encounters with group conversation circles to discuss the contents and define the parameters for choosing case studies. Bibliographic and documentary research.	(a) Onze8 Association (Vitória, ES); experiences in ATHIS and the Território do Bem (Territory of Good); (b) Learning in bioconstruction: a case study in the Pequeno William settlement (DF); (c) Application of ATHIS in São Vicente/SP, with a development partnership with CAU/SP; (d) Sociotechnical advice in Santa Luzia, Structural/DF; (e) The Union/SP Building.
Sociotechnical adequacy for agroecology and urban agriculture	Sociotechnical Adequacy AST (DAGNINO, 2019); Sustainable Agriculture (CAPORAL; COSTABEBER, 2004); and Urban and Periurban Agriculture (AUP) (SANTANDREU; LOVO, 2007).	For the organization and structuring of the chapter, we used google docs platform, exchanges through social networks, online meetings and conversation circles, ensuring dialogicity along the route. Bibliographic and documentary research.	(a) The experience of Gramorezinho in Natal/RN: organic agriculture or agroecology?; (b) The experience of Serrinha do Paranoá and its waters that supply the Distrito Federal – agroecology as a practice to emerge waters; (c) The experience of Surveying Areas for Agrourbania - University of Brasília / College of Planaltina; (d) The experience at the Rancho de Terra in the Pequeno William, Planaltina/DF settlement; (e) The experience in the Urban Indigenous Territory Xucuru in Brasília/DF.
Ecosystem Health, Sanitation and Governance	Solidarity technology (DAGNINO, 2019); Ecosystem health (GOMES; MINAYO, 2006); and Social Determinants of Health (SD) (BUSS and PELLEGRINI apud ÁVILA; DANTAS; DUARTE, 2019).	For the organization and structuring of the chapter, we used google docs platform, exchanges through social networks, online meetings and conversation circles, ensuring dialogicity along the methodological route built from the listening of reports of experiences in the territory. Data collection and bibliographic and documentary research.	(a) Community Safety Council of Tororó CONSEG and the Greater Tororó Region - Distrito Federal; (b) Women’s Movement of the Ginga Suburb of Salvador/BA; (c) Environmental/BA multipliers; (d) Child Environmental Agent Ceilândia/DF; (e) Local Community Sanitation Management for Community of Santa Luzia/DF.

Table 1: Synthesis of the chapters produced in the discipline Fundamentals in Science, Technology and Society (CTS) – Habitat, Agroecology, Solidarity Economy and Ecosystem Health. Source: elaborated by the authors (2021).

The 6 chapters developed as a collective product of the extension discipline were incorporated as a collection of the residence and constitute a fundamental support material of the course, being the main bibliographic reference of the disciplines and activities.

THE PEDAGOGICAL PROJECT OF THE COURSE

The proposal socially and territorially articulates three interdisciplinary themes: Habitat (housing, architecture, urbanism, environment); Agroecology (food sovereignty, family farming, field, and city integration); Health (epidemiological surveillance, collective health, family health, sanitation, eco-sanitation and ecological infrastructure) and a fourth transdisciplinary theme: Associated Work (solidarity economy, education and education, occupation, income and solidarity technology).

The work area consists of the territory of the Distrito Federal and its surroundings and is characterized by a very close and complicated city/field relationship, in which both urban and rural spaces appear in their aspects more or less mixed with each other.

Despite the transitions and variations, in the approach of this area, it was decided to structure the typologies initially by their rural (traditional communities and settlements and pre-settlements of the agrarian reform) or urban, in order to contemplate the specific demands arising from the characteristics of regularization of these spaces.

The territories of the Distrito Federal can be divided into: regular areas – consolidated and formally established urban areas; regularized or re-urbanized areas - areas that have undergone re-urbanization, and regularization processes; and, finally, informal areas – those that remain categorized as informal or irregular, spaces often absent from any formal intervention of the State (ANDRADE et al., 2019).

In the Distrito Federal, currently, there are 508 indirect occupations in urban and rural areas that are not on the map of the 2009 Master Plan for Spatial Planning (PDOT), such as ARIS or ARINES. A map with these new areas was presented by the Secretary of State for Urban Development and Housing (SEDUH) at the II Forum of the Metropolitan DF Nucleus of the Brasil Cidades Project, in FAU/UnB university week 2019, in October of that year.

Decree No. 40,254, of November 11, 2019, provides for procedures applicable to urban land regularization (Reurb) processes in the Distrito Federal, pursuant to Federal Law No. 13,465 of July 11, 2017. Art. 2 presents one of reurb's objectives, namely:

identify informal urban centers that should be regularized, organize them and ensure the provision of public services to their occupants, in order to improve urban and environmental conditions in relation to the situation of previous informal occupation.

In some of these territories, the research groups that lead this proposal are already working linked to UNB extension centers and projects conducted by the ITCP Incubator (UnB/FUP) and the Peripheral Research and Extension Group (UnB/FAU), which direct the

Notice 36/2018 CNPQ/MCTIC/MDS Tecnologia Social).

The territories of the Distrito Federal to be worked on in the residence cover the Northern Region (Serrinha do Paranoá/Varjão/Serrinha); Planaltina region for two settlements of agrarian reform (Pequeno William and Oziel III); Southern Region (Estrutural City), ARIS Dorothy Stang, ARIS Sol Nascente, and Quilombolas Territories in the state of Goiás (Quilombo Mesquita), according to Figure 1. Following are shown drone images of all territories.

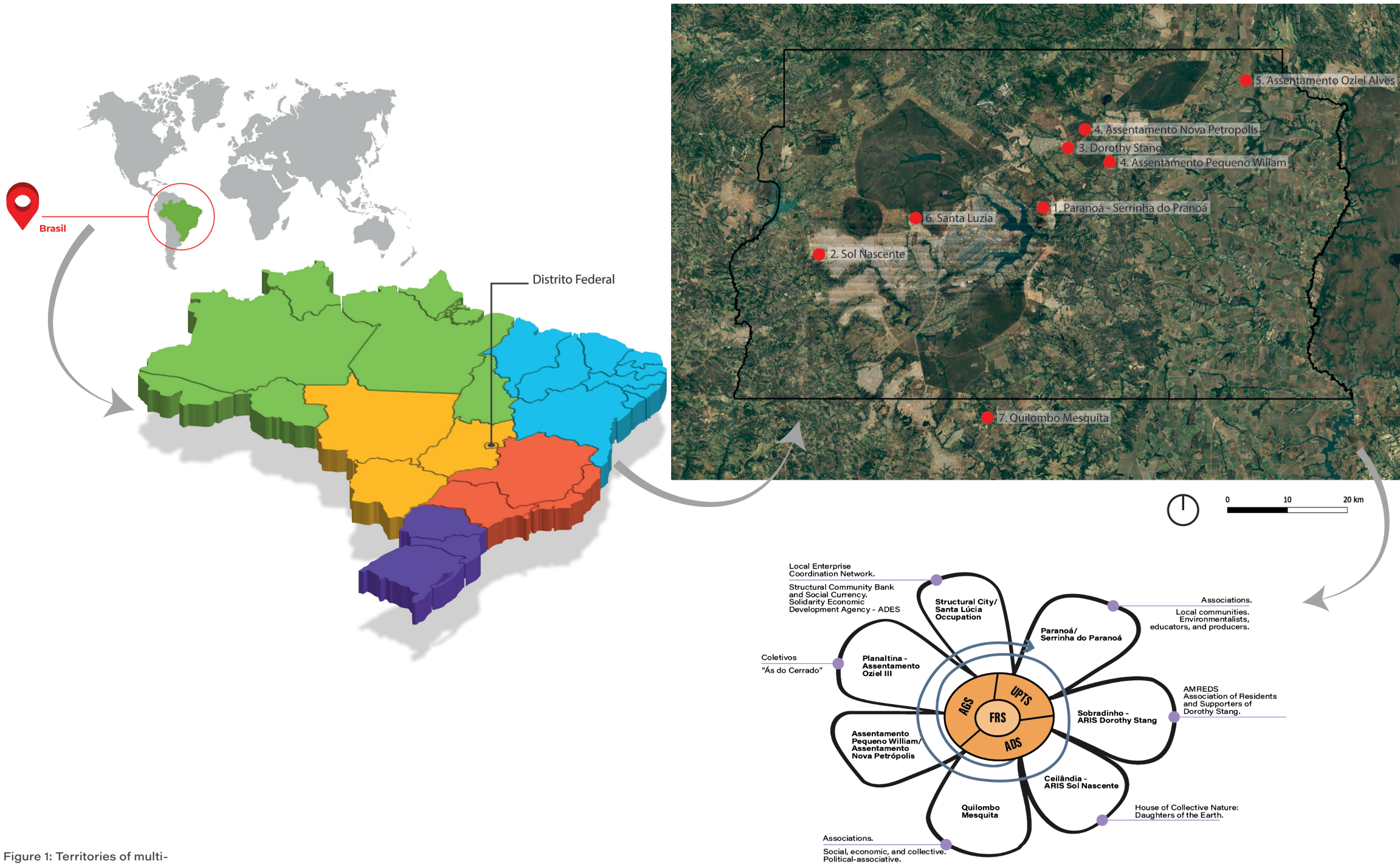


Figure 1: Territories of multi-professional residence CTS.
Source: CTS Residence, 2022.



**SERRINHA DO PARANOÁ
PRODUTORA DE ÁGUA!**

**BRASÍLIA PRECISA DAS ÁGUAS
DÁ SERRINHA DO PARANOÁ!!!**

**CERRADO
CAIXA D'AGUA
DO BRASIL
SERRINHA
DO PARANOÁ
AREA DE
ABASTECIMENTO
DE AGUA**

**SERRINHA DO PARANOÁ
PRODUTORA DE ÁGUA!**

Ceilândia - ARIS Sol Nascente

Photo: Valmor Pazos Filho



INFRAESTRUTURA SOCIOECOLÓGICA E OCUPAÇÕES INFORMAIS NA MICROBACIA DO RIO MELCHIOR:

UMA PROPOSTA DE DESENHO URBANO SENSÍVEL À ÁGUA PARA O SOL NASCENTE.

ALUNO:
FELIPE SOUZA LIMA

ORIENTADORA:
LIZA MARIA SOUZA DE ANDRADE



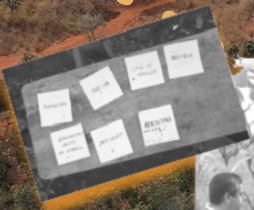
Sobradinho - ARIS Dorothy Stang

Photo: Valmor Pazos Filho



Planaltina - Assentamento Pequeno William

Photo: Valmor Pazos Filho



A collage of images arranged in a grid. The top row contains five photographs: a group of people standing outdoors, a person in a yellow shirt working, a person in a blue shirt working, a close-up of a child's face, and a group of people sitting together. The second row contains five architectural floor plans, each showing a different layout of buildings. The bottom row contains five photographs of buildings, showing various styles and conditions of the structures in the settlement.



TERRA:
NA
CÉU

CONSTRUINDO CENÁRIOS SUSTENTÁVEIS NO
ASSENTAMENTO
OZIEL ALVES III

Cidade Estrutural - Ocupação Santa Luzia

Photo: Valmor Pazos Filho



SANTA LUZIA RESISTE
a luta pelos direitos à cidade, à água e ao saneamento

REUNIÃO PÚBLICA: CÂMARA LEGISLATIVA DO DISTRITO FEDERAL - CLDF/UNIVERSIDADE DE BRASÍLIA - UNB

9H A

Transmissão: Canal do Youtube TV Web CLDF 16 de novembro de 2020.



Quilombo Mesquita

Photo: Valmor Pazos Filho



QUILOMBO MESQUITA CALENDÁRIO



JANEIRO



A ORIGEM DO QUILOMBO MESQUITA E A HERANÇA DAS ESCRAVAS ALFORRIADAS

A história do quilombo mesquita é contada há mais de 200 anos, mas a origem do quilombo de Mesquita, formado por escravos de cor branca, negros e mestiços (mulatos), teve uma fazenda chamada Mesquita. Sua propriedade, José Carlos Mesquita, é um fazendeiro de café. Mesquita criou aqui duas terras para filhos escravos de fazenda, uma vez que se tornou difícil a produção nas terras de Capangue de Goiás. Entre os que foram 180 mulheres, sendo elas Maria Abade, Mariazinha Pereira Braga e Maria Francisca Costa, receberam um pequeno terreno de 10 hectares em Mesquita, Pernambuco. Depois de anos, Mesquita foi vendida para o senhor de engenho de Mesquita, que legou a propriedade dos tradicionais cultivos de mandioca e cana-de-açúcar a sua sobrinha e esposa chamada Mariquinha.

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The essence of residence consists in uniting graduation and extension in a trans-multi-interdisciplinary character with the vision of university public policy (opposite that of private or official philanthropy) in the training of 35 trans-multi-disciplinary technical agents (managers, urban architects, lawyers, economists, sociologists, social workers, technicians, and engineers, community health agents), of which 28 will receive scholarships, and 14 territorial agents (2 agents from each of the 7 territories around the Distrito Federal described below) able to act as multipliers of community initiatives, to provide sociotechnical advice to local entities and to articulate resources, people, entities, tools, and territorial tactics in seven territories surrounding the Distrito Federal in favor of the leading character of subjects and groups in their daily territories.

Part of the project is being funded by the 2021 ATHIS notice of CAU/BR and also has a parliamentary amendment appeal by Mrs Erika Kokay (PT/DF) to pay scholarships to 28 students at the specialization level and 14 scholarships for territorial agents over 18 months.

Within the internal scope of UnB, the MULTIPROFESSIONAL RESIDENCY CTS is being organized by members of the Peripheral Research and Extension Group, emerging works, the Technological Incubator of Popular Cooperatives (which is an extension program operating under the theoretical basis of CTS and PLACTS Studies) and the Science, Technology and Society Policy Center (NPCTS/CEAM). It has a partnership with the Nucleation of the Residency AU+E UFBA/UnB, the BrCidades Network, the Housing-Advisory Network, the MST, Fiocruz and CAU/BR.

The course will involve training and education to promote sociotechnical advice on social management plans for habitat production, agroecology, labor generation, and solidarity economy, ecosystem health, and sanitation.

The course has a total workload of 480h and a duration of 18 months (3 semesters). It is structured into 08 modules, of which 07 are bimonthly (Introductory Module, 05 Thematic Modules and Module Research / Preparation of Final Work) and 01 is annual (Module Experiences in the Territory). The Introductory Module and the 05 Thematic Modules have a workload of 60 hours and are intended for classes, lectures, orientations and round tables; The Research Module has a workload of 30 hours and is intended for the orientation and preparation of the course completion work; the Experiences in the Territory Module has a workload of 90 hours and is intended for experiences in the territories from field classes, visits and workshops. The summary table (Table 2) presents the organization of these activities.

SEMESTER I	Two-month period 1 60 hours	Module Foundation in CTS and Freireana Education [WL= 60h] Introductory concepts and knowledge knowledges: Connections of knowledge; Sociotechnical adequacy; Solidarity technoscience; Freireana Education, Social Design and Labor Culture (art, education and popular culture, solidarity trade); Territorial Connections; Habitat production in the countryside and in the city; Agroecology; Ecosystem Health.
	Two-month period 2 90 hours	Thematic Module 1: Connection of Knowledge and Solidarity Technology [WL= 60h] Sociotechnical adequacy; Economy and solidarity finances; rotary solidarity funds, associative and cooperative, cooperation and associated work; generation of work and income, banks and social currencies; organization and studies of labor cultures. Experience in the Territory Module [WL= 30h] Subject-network, perspectives in the territory, social struggles, devices of political directivity, practices in ATHIS.
SEMESTER II	Two-month period 3 75 hours	Thematic Module 2: Territorial Connections [WL= 60h] Subject-network, perspectives in the territory, social struggles, devices of political directivity, practices in ATHIS. Experience in the Territory Module [WL= 15h] Practical classes/field visits/workshops in an urban context: Ceilândia/ARIS Sol Nascente and Cidade Estrutural/Santa Luzia.
	Two-month period 4 75 hours	Thematic Module 3: Habitat Production in the countryside and in the city [WL= 60h] Participatory spatial planning, right to the city, social housing project in the countryside and in the city. Demands, vocations and analysis of the problem. Local identity, existing knowledge, spatial patterns and events. Dimensions of sustainability (social, cultural and emotional, economic and environmental). Code generation, language establishment. Community participation. Experience in the Territory Module [WL= 15h] Practical classes/field visits/workshops in urban context (ARIS Dorothy Stang) and rural context (Quilombo Mesquita).
SEMESTER III	Two-month period 5 75 hours	Thematic Module 4: Agroecology, Urban Agriculture [WL= 60h] Urban agriculture planning and citizenship. Organic/fresh food, family participation and food sovereignty. Experience in the Territory Module [WL= 15h] Practical classes/field visits/workshops in rural context: Pequeno William Settlement and Varjão/Serrinha.
	Two-month period 6 75 hours	Thematic Module 5: Ecosystem Health [WL= 60h] Epidemiological surveillance practices, collective health and family health, eco-sanitation, and ecological infrastructure. Experience in the Territory Module [WL= 15h] Practical classes/field visits/workshops in urban context (Santa Luzia) and rural context (Oziel Alves III Settlement).
SEMESTER IV	Two-month period 7 30 hours	Module 6: Search [WL= 30h] Introduction to the methodology of scientific research applied to microprojects of local action, aiming to assist the student in the realization of the Course Completion Work, an academic document indispensable for approval in the CTS Residency.
	Completion of the Course	Conclusion Final Works and Defense Banking Course completion activity: Presentation seminar/defense stands.

Table 2: Synthesis of the organization of the Residency Course - CTS (Postgraduation + Extension) - Habitat, Agroecology, Solidarity Economy and Ecosystem Health. Source: elaborated by the authors (2022).

FINAL CONSIDERATIONS:

The structure and operation of the proposal of a Lato Sensu postgraduate course of Multiprofessional Residency CTS – Science, Technology and Society that socially and territorially articulates three interdisciplinary themes: Habitat (housing, architecture, urbanism, environment); Agroecology (food sovereignty, family farming, field and city integration); Health (epidemiological surveillance, collective health, family health, sanitation, eco-sanitation and ecological infrastructure) articulated across a fourth transdisciplinary theme: Associated Work (solidarity economy, training and education, occupation, income and solidarity technoscience, generation of associations and popular cooperatives).

In summary of the data previously presented, the course will involve training and education from the perspective of social technology (immediate perception) and solidarity technology (sociotechnical adequacy associating popular basis and scientific epistemological essence), it is expected to work from three guidelines:

i) work technical codes and standards in the proposition of Microprojects and Local Action Programs (MPAL) through sociotechnical advice focused on decentralized participatory processes with social groups initially belonging to seven territories around the Distrito Federal;

ii) implement a methodology that takes into account new languages to express the cognitive policy (popular, community and identity) of community leaders and social movements, in order to broaden the understanding, reflection, appropriation and shared development of solutions in the face of sociocultural barriers; and

iii) community and self-managed associative forms of an open socioeconomic system, based on the values of cooperation and solidarity, called solidarity economy.

To update methodologies in social technology and innovative systems, the 1st National Meeting on Extension in Graduation Studies and Technical Advisory for The Production of Habitat healthier, resilient and supportive in the countryside and in the city was held, on August 17, 18 and 19, 2022. The meeting aimed to bring together academic residencies, specialization courses and research and extension groups that deal with the complexity of habitat production and technical advice/assistance in a debate on the extent of graduation school.

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