



# **The construction of interdisciplinary research: challenges and perspectives**

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## **Abstract**

This paper aims to reflect on the challenges and perspectives related to the first phase of the construction of interdisciplinary research, a discipline of the Postgraduate Program of Sustainable Territorial Development, Federal University of Paraná - Brazil (PPGDTS/UFPR), which aims to diagnose and identify the research problem. This discipline meets the objectives of the Program and aims fundamentally to promote, through interdisciplinary perspective, the dialogue with theoretical and methodological approaches that articulate natural and social sciences and consider the diversity, complexity, local knowledge and different livelihoods in the analysis of reality. The proposed interdisciplinary exercise requires the formation of a new perspective on reality, formed by the dialogue between different areas and forms of knowledge; a look that, open to new possibilities, goes back to the territory and to sustainable development. The objective of the first stage of interdisciplinary research was reached with regard to the territorial diagnosis and the identification / construction of research problems. The collectively constructed observation and diagnostic work allowed each individual student to exercise reflexivity, maturing his or her research object; not obviously in the same territory, but within the theme of Sustainable Territorial Development.

**Keywords:** Interdisciplinary Research. Sustainable Territorial Development. Curriculum framework.

## **A construção da pesquisa interdisciplinar: desafios e perspectivas**

### **Resumo**

Este artigo pretende refletir sobre os desafios e perspectivas relacionados com a primeira fase da construção da investigação interdisciplinar, uma disciplina do Programa de Pós-

Graduação em Desenvolvimento Territorial Sustentável da Universidade Federal do Paraná - Brasil (PPGDTS/UFPR), que visa diagnosticar e identificar o problema da investigação. Esta disciplina cumpre os objetivos do Programa e visa fundamentalmente promover, através de uma perspectiva interdisciplinar, o diálogo com abordagens teóricas e metodológicas que articulem as ciências naturais e sociais e considerem a diversidade, complexidade, conhecimento local e diferentes meios de subsistência na análise da realidade. O exercício interdisciplinar proposto exige a formação de uma nova perspectiva da realidade, formada pelo diálogo entre diferentes áreas e formas de conhecimento; um olhar que, aberto a novas possibilidades, regressa ao território e ao desenvolvimento sustentável. O objetivo da primeira fase da investigação interdisciplinar foi alcançado no que diz respeito ao diagnóstico territorial e à identificação / construção de problemas de investigação. O trabalho de observação e diagnóstico construído coletivamente permitiu a cada estudante individual exercer reflexividade, amadurecendo o seu objeto de investigação; não obviamente no mesmo território, mas no âmbito do tema do Desenvolvimento Territorial Sustentável.

**Palavras-chave:** Pesquisa Interdisciplinar. Desenvolvimento Territorial. Sustentável. Organização Curricular.

### La construcción de la investigación interdisciplinaria: desafíos y perspectivas

#### Resumen

Este artículo tiene como objetivo reflexionar sobre los desafíos y las perspectivas relacionadas con la primera fase de la construcción de la investigación interdisciplinaria, una disciplina del Programa de Posgrado en Desarrollo Territorial Sostenible de la Universidad Federal de Paraná - Brasil (PPGDTS / UFPR), cuyo objetivo es diagnosticar e identificar El problema de investigación. Esta disciplina cumple los objetivos del Programa y tiene como objetivo fundamental promover, a través de una perspectiva interdisciplinaria, el diálogo con enfoques teóricos y metodológicos que articulen las ciencias naturales y sociales y consideren la diversidad, la complejidad, el conocimiento local y los diferentes medios de subsistencia en el análisis de la realidad. El ejercicio interdisciplinario propuesto requiere la formación de una nueva perspectiva de la realidad, formada por el diálogo entre diferentes áreas y formas de conocimiento; una mirada que, abierta a nuevas posibilidades, vuelve al territorio y al desarrollo sostenible. El objetivo de la primera fase de la investigación interdisciplinaria se logró con respecto al diagnóstico territorial y la identificación / construcción de problemas de investigación. El trabajo de observación y diagnóstico construido colectivamente permitió que cada alumno ejerciera la reflexividad, madurando su objeto de investigación; obviamente no en el mismo territorio, sino bajo el tema de Desarrollo Territorial Sostenible.

**Palabras clave:** Investigación interdisciplinaria. Desarrollo Territorial Sostenible. Organización Curricular.

#### 1 Introdução

This paper aims to reflect on the challenges and perspectives related to the first phase of the construction of interdisciplinary research, a discipline of the Postgraduate Program of Sustainable Territorial Development, Federal University of Paraná - Brazil (PPGDTS/UFPR), which aims to diagnose and identify the research problem. This discipline meets the objectives of the Program and aims fundamentally to promote, through interdisciplinary perspective, the dialogue with theoretical and methodological approaches that articulate natural and social

sciences and consider the diversity, complexity, local knowledge and different livelihoods in the analysis of reality.

This exercise is extremely rich, because it instigates intellectual curiosity, awakens interest in observing and apprehending reality and opens up numerous perspectives in the construction of themes / research problems based on the diagnosis of the territory. Its effectiveness is only possible with participation in the planning and in the classes of at least one teacher from each PPGDTS research line, namely: 1) Socioeconomics and local knowledge; 2) Public policies and social networks; 3) Ecology and biodiversity. We emphasize, however, that this poses challenges, among which the difficulties of teachers and students in dismissing their prejudices, as well as their theoretical certainties and methodological choices, reflecting traditional academic formations. In other words, the proposed interdisciplinary exercise requires the formation of a new perspective on reality, formed by the dialogue between different areas and forms of knowledge; a look that, open to new possibilities, goes back to the territory and to sustainable development.

In order to reach the proposed objective, we organize the discipline in focus and the reflections presented here in two interlaced stages: Epistemology of science and identification of the territory; Elaboration and consolidation of the diagnosis. In each one, we critically approached the worked / discussed during the semester, in light of the selected theories and / or fieldwork. Finally, we add final considerations, where we evaluate the process as a whole and underline the difficulties and achievements inherent to the construction of interdisciplinary research.

## **2 Theoretical Approaches**

### **2.1 Epistemology of Science and Identification of the Territory**

In a broad perspective of education, the environmental issue is shaped by a dynamic situation of interdependence networks, which brings to the forefront the need to look, research and diagnose real problems through the interpenetration of large areas of knowledge. The so-called "environmental crisis" - which is nothing more than a crisis of the human condition itself, which manifests itself in nature - transcends the theoretical limits given by curricular and / or disciplinary organization of knowledge. There is no way to isolate the technician from the political, the pedagogical practices of political action, nor consider the scientific knowledge dissociated from the conflicts that permeate social materiality. Thus, our conduct in the discipline "Interdisciplinary Research I" is based on the understanding of interdisciplinarity as a dialogical practice of knowledge that interpolates in an organized and cooperative effort to assimilate and process the asymmetry and complexity proper to the current social reality.

Specialized knowledge joins an evolutionary path in which the methods and concepts of each area generate something that does not fit into the historically systematized, after all, as Epstein has put it, there is a "real need to find new explanations for which the disciplines alone are insufficient" (EPSTEIN, 2003, p.5).

According to Boaventura Sousa Santos (2001, 2002), this insufficiency reflects the uncertainties, transience, and complexity of the present era, where science itself must undergo a process of self-questioning and reflexivity that allows us to revise its positions and bring light to today's perplexity. The dominant paradigm - which gave mathematics centrality in explanations and human control and domination over nature - unconditionally separated scientific knowledge from other forms of knowledge, always seeking to delineate the order and functioning of the world from the formulation of laws general; truths constructed from observation, experimentation, verification and causality. The nascent social sciences themselves in the nineteenth century sought to establish these laws, for it was believed that "as it was possible to discover the laws of nature, it would also be possible to discover the laws of society" (SANTOS, 2002, p.65). The contestation of this approach begins to show signs of crisis throughout the twentieth century; in the last decades these signs are deepening to the point that the crisis becomes irreversible.

In this context, Boaventura considers the emergence of a new paradigm as inevitable. This paradigm aims to enable a "prudent knowledge for a decent life" and is anchored in four main perspectives: a) All scientific-natural knowledge is social scientific. This, however, implies the overcoming of dichotomies between natural and social sciences, nature and culture, subjective and objective, among others; b) All knowledge is local and total. It is essential to go beyond disciplinary boundaries and to work with a theoretical methodological framework that can be used in the locality and, from there, in the totality; the "projected human action in the world from a local space-time" (SANTOS, 2001, p. 48); c) All knowledge is self-knowledge. The subject cannot be separated from the object, in addition knowledge, resubjected, teaches to live; d) All scientific knowledge aims at becoming a new common sense. The emerging paradigm must take ownership of common sense and return it reworked, transformed. This new common sense must be: ethical (supportive and responsible with the future), political (participatory) and aesthetic (re-enchanted). However, Boaventura warns that epistemology is at the forefront of practice and that this new way of thinking / making science, which feeds on social life, needs to be gradually built.

We now return to the environmental issue. The construction of this new paradigm permeates the dimensions of economics, society and culture, since these become interdependent in relation to the need for new responses with a multidimensional view, since the said environmental problems are the result of the interactions of the subjects in social and ecological processes and require a spatio-temporal approach. In this, the idea of environmental epistemology (LEFF, 2001) is based on the idea of reestablishing the link between social and natural in an attempt to analyze environmental conflict in a political perspective of reunification of the discussion about the fragmentation of knowledge in favor of a model systemic and integrative.

For this, environmental knowledge, or the construction of this environmental knowledge proposed by Leff (2001a) is only possible when there is a relaxation of various rationalities (capitalist and scientific). Environmental rationality presupposes the inter and transdisciplinary integration of knowledge in order to explain the behavior of complex socioenvironmental systems, as well as to

problematize the fragmented knowledge of each discipline. Leff (2011), in contributing to the construction of this environmental knowledge, opens a perspective of analysis of the production and application of knowledge as a process that includes epistemological conditions for the possible articulations between sciences and the processes of internalization of emerging environmental knowledge in the arduous nuclei of scientific rationality, and the hybridization of sciences with the field of "traditional", popular, and local knowledge. In this sense, the environmental problem promotes a more complex process of knowledge and knowledge to apprehend the material processes that shape the field of relations Society and Nature.

Finally, the environmental knowledge proposed by the author is forged in the encounter (confrontation, interbreeding, hybridization and antagonism) of knowledge differentiated by rationality-identity-sense matrices that respond to strategies of power for the appropriation of the world and of nature. It is in this movement and in this disenchantment of the power imposed by knowledge that the purpose of interdisciplinary approach opens for the reconstruction of knowledge, on the road to the reconstitution of identities and the dialogue with another knowledge.

In view of this epistemological framework, we propose an exercise in looking at and thinking about reality, considering alterity, ethics, diversity and the dialogue between knowledge. For this epistemological and methodological reflection, to think and raise awareness about the complexity and interdisciplinarity present in the relations between society and nature, we have the theoretical contribution of several authors in the area of environmental sciences, such as Phillipi Jr and Fernandes (2015), Phillipi, Tucci, Hogan & Navegantes (2000), Raynault (2004), Rocha (2004) and Guattari (1990), among others. Within this approach, we seek the development of an interdisciplinary exercise that makes it possible to identify and construct a diagnosis about a given territory considering the different knowledge. In order to do so, based on the theme of the Sustainable Territorial Development program discussed with the students, we sought in the first instance to reflect theoretically on the environmental sciences and on possibilities to observe reality. The main purpose was to attend to the difficulties inherent in field research, as well as to the importance of respecting the other, their vision and perception of the world; questions that refer to the ability to look, listen and record, and then reflect on the data of a given reality. It was the preparation, so to speak, for fieldwork; awareness of the reality in focus. In a second moment, we try to value the disciplinary knowledge and the dialogue between the areas of knowledge, as a motto to organize the information and synthesize the diagnosis and, by extension, make possible the construction of an interdisciplinary exercise. This construction, from the perspective of the different spheres of knowledge, is, as it were, an instigating task, since the formations of the masters are varied: Agroecology (1), Philosophy (1), Environmental Management (3), Geography History (3), Marketing (1) Pedagogy (1), Psychology (1) and Executive Secretariat (1).

The objective of the trajectory here reported is to put into operational terms the making of this group of students highlighting the collection of data in the visit to the community, the bibliography that bases the methodological course, in short, the elements of analysis that make up the diagnostic framework. This dialectical

perspective of going and coming, is fed back on the theoretical-conceptual elements, the dialogue in the group, the theoretical deepening of each student in his area of formation in the attempt to narrow remaining gaps of the disciplinary walk with the intention of producing integrative knowledge about of the local reality.

The analysis of this reality is obviously composed of subjects' lenses. There are several glimpses about the same reality. Reality is a totality, fragmented due to the inability to grasp it in its integrality and permeated by disciplinary conceptions. The exercise of the articulation and connection between the perspectives and perspectives has in common some points: the environmental question - given the specificity of the territory; sustainable development - even though it is a polysemic concept that requires a deep and fruitful debate, is the starting point for interdisciplinary construction. It is important to stress that the sustainability category comprises several dimensions that correlate with one another: social, political, economic, environmental, cultural. Having said this, we'll discuss the characterization of the territory.

## 2.2 The Territory: Characterization of the research region

Before we define our field of investigation, it is important to address, even briefly, the issue of territoriality. Koga addresses the relevance and dynamicity of the territory, stating that:

The importance of the territory in its multidimensions lies in considering it, in its essence, as the concrete ground of politics, the root of numbers and the reality of collective life, which proactively represents the basis of the exercise of citizenship, which underlies relations social neighborhood, power, since this territory is also a dynamic factor in the process of social exclusion / inclusion, where social inequalities are evident (KOGA, 2011, p.33).

The territorial reality is translated through the conditions of consumption and production in which the population is situated and of their conscience and attitudes before such conditions. This reality cannot be explained by itself, but above all by historical-structural-environmental determinations; the appearance of the facts means only an indication in the trajectory of the discovery of this reality. In this sense, socio-historical knowledge of the existential conditions of the population, its contribution to the production of society, the way in which it participates in the distribution and destination of goods produced, the problems experienced in that territory, potentialities, values and needs, constitute this reality under objective and historical conditions. In this perspective, it is necessary to reveal both objective and quantitative aspects such as income, education, available social equipment, health and economic conditions as qualitative aspects such as traditions, customs, cultural, political and ideological aspects that intertwine with the other elements weave the mosaic that constitutes the territory

The challenge assumed here is to build with the students the ability to elaborate diagnoses on this territory, exercising from the beginning the valorization of their disciplinary knowledge and the invitation to traffic in the interdisciplinary

perspective that causes discomfort, certain insecurity and uncertainty. Thus, adopting the territory in its materiality as a reference point of analysis enables concreteness and delineates the path to be traced. The reality, the concrete, the empirical data, the opinion of the subjects that give life to the territory becomes the central element of the analysis, the beacon for discussion and the investigative trail.

Saquet (2011) assists in understanding the territory category by conceiving it as the social appropriation of a portion of geographic space, a product of social relations, of networks, in which the processes of communication, cooperation, exchange, concrete and abstract elements. The construction of space is dynamic and historical, mediated by economic, political, cultural, social and in relation to nature.

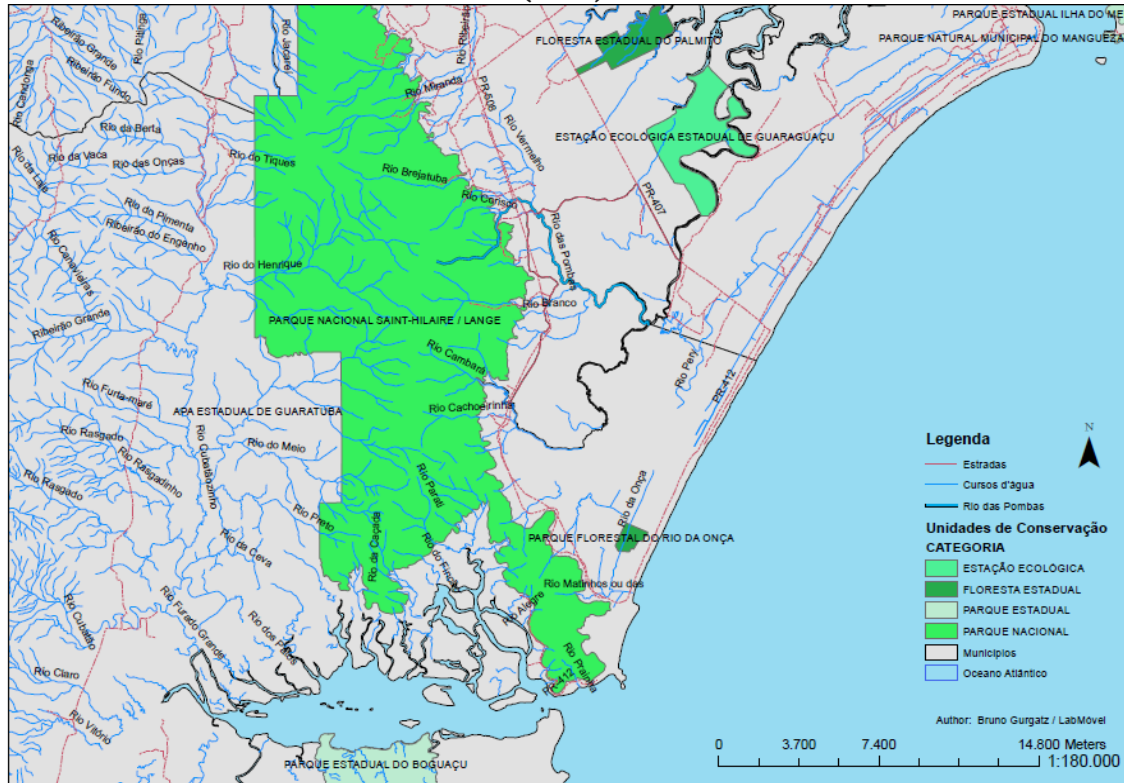
That said, we went to the territory that made feasible the proposed exercise, that is, the coast of Paraná, specifically a rural area of the municipality of Paranaguá.

The coast of Paraná is a region with great socio-environmental disparity, especially in the rural area. In Paranaguá, an economically port-centered city, the economy turns to large companies, attracts and expands the number of industries that presses on the ground and collaborates to attract rural workers to jobs generated in this port environment. The farmers who manage to stay and produce in the rural area are those who generally articulate and cooperate with each other in order to foster the needs of the territory or productive units (OLIVEIRA, 2015).

Considering that each territory has its specificity (cultural, natural and historical), productive units will reproduce in a unique way, adding the characteristics of local know-how, encouraging the creation of a territory where people are valued, their knowledge and creating new opportunities for generation of work and income.

Thus, from the knowledge of this reality, it was decided to investigate the Paranaguá Rural Region, having as a geographic limit the Microbacia do Rio das Pombas (Figures 1 and 2), in an attempt to know the physical environment, its economic potentialities, its reality social context in a cultural context. To give light to the reality lived by the rural farmers of the region and to provide an exercise in the construction of an interdisciplinary diagnosis, three family units were visited, two in the Quintilha Colony and one in the Maria Luisa Colony, which subsist with tourism activities and dairy production respectively.

Figure 1 - Territorial Delimitation of the Pombas River Basin and Conservation Units (CU's)



Source: Authors

Figure 2 - Region of the Micro Basin of the Pombas River and CU's



Source: SEMA 1992



The two properties in the Quintilha Colony, rural area of the municipality of Paranaguá, are located in a privileged environment in terms of natural resources and use this fact to organize ecotourism activities. There is located the Quintilha Waterfall, formed by the Brejatuba River, famous in the region for its natural beauty. The access to the place is given by the PR508, known as Alexandra-Matinhos Highway; are approximately four kilometers on ground road. On weekends from the summer season (New Year to Carnival), it is common, according to the reports of the owners, the waterfall to receive many tourists. The profile of these visitors is varied: international or regional tourists, families, adventurers, among others. Most of the tourists who have visited the property regularly visit the region and this encourages some activities, such as snack bars (present in the two properties in question) that offer products at affordable prices. Of course, because of the seasonality, the other periods of the year, especially in the winter there are economic difficulties. Finally, it is important to say that in these family units a common problem was found in the coast of Paraná: lack of information regarding environmental issues. It is not yet clear if these properties are located in or around the Saint-Hilaire / Lange National Park.

The property in Colonia Maria Luísa belongs to a descendant of Dutch who has been in the region since 2000. Natural of the region of Carambeí, famous for its Dutch tradition and its products derived from milk, has set the goal of making this production viable on the coast. Since then, it has been producing and marketing dairy products such as colonial cheeses and ice cream at various points of sale through the night fairs in the city of Paranaguá. However, it complains that it does not have technical assistance regarding the cultivation of pasture. Another reason for complaining is that because they do not own the land, they do not have access to public policies, such as the food acquisition program. Its future project is the implementation of rural tourism, in which it wants visitors to know their production system and to taste their products for commercialization.

### 3 Elaboration and consolidation of the diagnosis

The objective of the diagnosis of the study area was to show the heterogeneities of this territory, in order to better understand the dynamics behind the diversity of situations. It was a descriptive relationship in a common spatial framework essential to cross the different disciplinary looks on the same reality, considering the locally constructed knowledge.

At first, the research area was reconnoitered, seeking an approximation with reality, gathering information in loco with the objective of compiling the data collected in the field and, finally, an oral presentation in which the researchers were able to expose their initial impressions.

Secondly, after discussions mainly based on the readings by Raynaut, Zanoni, & Lana (2002) - *Diagnosis and Problems for Research, Methodology of a Preliminary Diagnosis and Methodology of Interdisciplinary Diagnosis: the construction of a common framework of work* - which addresses the experience of an interdisciplinary research carried out in the *PhD in Environment and Development of the UFPR (MADE)*, besides the recent work of Phillipi Jr and Fernandes (2015), it was verified the need to seek secondary data about the region of the research and make

new visits to make feasible the territorial recognition. Inspired by Raynaut, Zanoni, & Lana (2002) we propose the collective construction of a common diagnostic framework entitled "Society and Nature". Unlike, however, from the MADE exercise, our framework involved three areas of dominance, namely: a) Nature and Culture; b) Economics and Labor; c) Public Policies.

Secondary data that help validate the object of study and give us information about the spatialization of indicators, the common framework of diagnosis "Society and Nature" of the Pigeon River Microbasia allows us to explain and analyze the conflicting situations and the contradictions in the in order to transcend the disciplinary vision of each researcher in the elaboration of a broader understanding of reality in the search for a common framework of investigation.

In this sense, understanding reality is the result of an articulation of some devices:

- a) analysis of the reports individually constructed by each researcher in which their disciplinary knowledge is evidenced, which was enriched by field visits, plus dialogues with other areas of knowledge for the elaboration of domain areas;
- b) interpretation of secondary data with the spatialization of indicators;
- c) group discussion aiming to expose the objective reading of the reality of each of the researchers.

These activities, which integrate a heterogeneous analysis of reality, make up the most important product of interdisciplinary research, which is the diagnosis of the region itself, or the diagnosis of the spatialization of heterogeneities in the region, conceived not only by the different disciplines, but, especially by the collective view with a view to the complex understanding of a common reality Almeida, Miguel, NettoMielitz, Verdum, Beck & Zanoni (2004).

In the classroom, with the presence of all teachers and students, the phases of the diagnostic construction process were discussed. It was established that for its execution it would be necessary to organize into groups for the notes of the three dimensions listed, as well as the construction of a Common Evolutionary Glossary. It was the first step in the collection of information and in the interdisciplinary dialogue that would culminate in the interdisciplinary writing of a single text.

The group responsible for the Nature and Culture dimension organized its work in three interrelated stages: Historical rescue; Geographic spatialization; Conservation units and socio-environmental conflicts. In the first, as its name suggests, it was researched on the history of the municipality of Paranaguá and, in particular, the Alexandra Colony (originally named Alessandra) dating back to the 1970s. In the second one, the geographic space was presented, highlighting the territorial limits, the main rivers and the communities of the region: besides Quintilha and Maria Luíza, São Luiz and Colônia Pereira; it was also highlighted the lack of basic sanitation, the waste collection system and the treatment and distribution of water made by the Maria Luíza Colony. Finally, in the third stage, the issues present in the communities that are inside or around Conservation Units were highlighted; the pressures, difficulties and conflicts inherent in this relationship, as well as the potential of ecotourism and rural tourism in the region.

The team that coordinated the data collection of the Economy and Work dimension, also organized the work in interconnected moments. In Economics,

subjects related to: land ownership; food safety; credit; marketing; partnerships and entrepreneurship. In the question Work was sought to delineate: labor rights and social benefits; recruitment and selection of family labor; training and development, and health and safety at work. It should be noted that part of the region's residents do not have legal ownership of the land and that this causes inconveniences and difficulties of numerous orders, such as the aforementioned lack of access to public policies that could favor the production and distribution of products developed basically through of the use of family labor.

The Public Policy dimension, in turn, organized the data collected from: demographic data; public security; environment; education; social assistance and health. It was raised that the region has 105 households, a Basic Health Unit, located in the Maria Luíza Colony, and a rural education school, with a teacher who serves twenty-one students. With regard to Social Assistance, residents need Paranaguá, Pontal do Paraná or even Matinhos to have access to services. In the specific case of the properties visited, different services of the assistance, such as the Service of Coexistence and Strengthening of Links (SCFV), can only be accessed in the municipality of Paranaguá.

The teams, designed in an interdisciplinary spirit, collected extremely interesting data from the region, as well as returned to the field to exercise their eyesight, listening and recording. They produced very rich material, exposed and discussed by the large group. We were ready for the biggest challenge: the construction of a collective diagnosis, which would involve the discussion of all the elements researched, the dialogue between different forms of scientific knowledge and local knowledge, and finally, collective writing.

### **3.1 Consolidation of the diagnosis**

The work that resulted in the consolidation of the diagnosis, represented here by a diagnostic framework (Table 1) and a common evolutionary glossary (Annex), was provocative, challenging and inclusive. It could not be different since it was the result of an interdisciplinary research construction that produced countless effects in the Class of 2015, evident both in the maturing of dialogues and in the perception of reality and in the construction of its research objects. We emphasize that the order of construction of the painting was the one of discussion in the room, although it was clear at all moments that the dimensions dialogue among themselves. What can be identified in the reading of the table itself.

Table 1- Common Diagnosis Society and Nature

| DIMENSION/<br>DOMAIN | DESCRIPTION       | MATRIX OF<br>INFORMATIONS   | LEGISLATION   | TERRITORIAL REALITY  | INTEGRATED<br>SOLUTIONS   |
|----------------------|-------------------|---|---|--|---|
| PUBLIC<br>POLICIES   | Health            | Health  | Access to services by citizens  | National Health Service (SUS)  | UBS Santa Escomação (general practitioner and gynecologist); Urgency / Emergency services, medical specialties, exams and mental health occur through the Paranaguá City Urban Center               |
|                      | PublicSecurity    | Access to the Quintilha and Maria Luiza Colonies; Ensuring physical security of property and persons and inhibiting crime | Federal Law 6514/08; Urban Mobility Policy  | Community Rural Patrol - Military Police; Only one property entry / No property entry resistance (easy to remove machinery)  | Improved access to rural community: road and street lighting  |
|                      | Environment       | Hydrographicbasin; Protectedareas   | Water Resources Policies; Basin Committee, Environmental Sanitation - Law 11.445/07; Solid Waste; SNUC; PNMA; IBAMA, ICMBio; IAP; CONAMA; Atlantic Forest Law   | Social and Enviromental impacts related with: drinking water supply for Maria Luiza Village; lack of sewage collection and treatment system; storm drainage, precarious system for collecting and disposal of solid waste; environmental restrictions for using of land. | Alternative water and sewage treatment systems; Recycling and separation of waste; Biodigester plant; Urban Drainage (road cleaning and maintenance and shackles at crossings)                      |
|                      | Education         | Countrysideschools  | Brazilian Law - Basic Guidelines for Education 9394/96; Municipal Council for Education; Municipal Council for School Feeding; Complementary Law for Countryside Schools 069/2007 – Field Education; Municipal Council for Supervising and Social Control of National Funds uses (FUNDEB) | Field School with 21 students in a Multiserial Class   | Promote approach with the University for teacher training, Creation of School Council for own budget management .   |
|                      | Social Assistance | To guide the population in how to access the public services  | Municipal Councils: Social Assistance, Children and Youth's rights; Council of Women and Elderly people   | The population has difficult accessing their rights  | Training workshops and inexpensive classes, to prepare womenand Youth in their search for Jobs; Public Bus Service; Strengthening of community organizations; LEADERSHIP EMPLOYMENT AND EMPOWERMENT |

|                    |  |  |  |  |   |
|--------------------|--|--|--|--|---|
|                    | Occupation                               | Formal Labour Record   | Social Insurance Law 12.873/14/ Social insurance for Small farmer; Complementary Law 128/19/12/08 – Micro-businessmen; Associations and Cooperatives Law 10.406/02 and 5764/71   | Casual labour; manpower shortage; Child labour; Seasonal work  | Labour contracts and individual microentrepreneur   |
| ECONOMY AND JOB    | Agriculture and Livestock                | Family labour; Production and trading; Food Safety                             | Law 12.873/14/ Social Insurance for Small Farmer; Complementary Law 128 - 19/12/08 regulatory normas for Micro-businessmen ; Law 10.406/02 Association; Law 5764/71 for Cooperative systems; PRONAF; Law for Health and Job safety | Small rural properties (subsistence agriculture); Palm heart monoculture, rice plantation; Owners' receptivity, potential for trade expansion: colonial cheese and ice cream; Poor product diversity, business informality, lack of land regularization, labor shortages, lack of product disclosure, problems with access and transportation to property, informal labor relations, lack of expertise and access to new techniques, farmers' social vulnerability | Diversification of tourism products and activities, investment in human capital (specialization and new techniques, including product handling), formalization of professional activities, land regularization, dissemination of products and association of trade relations; Good food hygiene and handling practices; PPE use |
|                    | Ecotourism and Rural Tourism             | Landscape  | National System for Conservation Units of Nature - SNUC - Federal Law 9.985/2000   | Restrictions to obtaining financing; seasonal touristic;   | Marketing; Covenants and Partnerships between public entities and providers of Professional natures tourisms activities;  |
| NATURE and CULTURE | History                                  | Historical occupation of the colonies; Location Demographic; Socialchanges     |  | Intermittent occupation; Ethnic diversity; Migration policy; Rural exodus, especially of young people  | Rescue and register of the material and immaterial culture of the community   |
|                    | Hydrography                              | Description of Rio da Pombas Micro River basin                                 | Water Resources Policies; Basin Committee; Environmental sanitation; Solid waste; Environmental sanitationLawn 11.445/07;  | Siltation and obstruction of the river system; Precariousness of environmental sanitation; Access difficulties; Contamination by pesticide use.  | Systematic analysis of soil and water; Health control and vectors   |
|                    | Nations Units for Conservation of Nature | Saint Hilaire/Lange National Park and Environmental ProtectionAreaof Guaratuba | National System for Conservation Units of Nature - SNUC - Federal Law 9.985/2000   | Non-continuous territorial boundaries  | Saint Hilaire/Lange National Park Management Plan   |
|                    | Environmental Conflicts                  | Land regularization; Environmental legislation;                                | National System for Conservation Units of Nature - SNUC - Federal Law  | Land regularization problems; Lack of dialogue between environmental agencies  | Revision of National Park boundaries due to anthropic action  |

|  |                     |  |   |  |  |
|--|---------------------|--|---|--|--|
|  |                     | Relationship between communities and environmental authorities | 9.985/2000  | and rural communities in the region surrounding the National Park  |  |
|  | Touristic Potential | Ecotourism; Rural tourism.                                     | National System for Conservation Units of Nature - SNUC - Federal Law 9.985/2000; Atlantic Forest Law | Presence of waterfalls; Proximity to Atlantic Forest and Nations Units for Conservation of Nature; Presence of agribusiness, livestock and dairy products; Differentiated landscape; Miscellaneous cultural aspects. | Marketing; Covenants and Partnerships; Community Tourism based system; |

Source: Class - Masters Programme - Sustainable Territorial Development

#### 4 Concluding Remarks

This paper sought to reflect on the challenges and possibilities inherent to the construction of interdisciplinary research. Discipline of the PPGDTS is taught in the first semester jointly by teachers who represent, as already said in the introductory lines, the lines of research of the program and that have training and research agendas different from each other. The main aim of the discipline is to foster interdisciplinarity, the articulation between social and natural sciences and the dialogue between knowledge in the analysis of reality (ROCHA, 2001). Here, this objective was sought from the diagnosis of the territory carried out in two colonies, Quintilha and Maria Luíza, in the rural area of the coastal municipality of Paranaguá.

During the exercise, major challenges were identified, among which we highlight: the difficulty of teachers and students to relativize their theoretical certainties and establish open and fruitful dialogues between the different areas of knowledge; difficulty in relativizing the gaze on reality, removing preconceived visions and practicing alterity, as well as the ability to look, listen and feel; finally, and based on the two previous ones, the difficulty of working collectively in the construction of a diagnosis and in an interdisciplinary writing. Despite the challenges, the group was able to construct a new perspective on reality, or rather new perspectives of apprehension and reflection of reality.

It is worth emphasizing that for the development of the proposal of the discipline in focus, the dialogues with the local producers were fundamental for the construction of environmental knowledge. The methodological approach to the visits to rural properties and the sensitive listening on the speeches of these actors allowed the construction of knowledge and respect about subjugated or often disregarded knowledge, while at the same time promoting the students' awareness of their own limitation of knowledge. At times the disciplinary knowledge was deconstructed, providing paths for a hybridization and dialogues of knowledge in the field of environmental complexity

In other words, we can say that the objective of the first stage of interdisciplinary research was reached with regard to the territorial diagnosis and the identification / construction of research problems. After all, the collectively

constructed observation and diagnostic work allowed each individual student to exercise reflexivity, maturing his or her research object; not obviously in the same territory, but within the theme of Sustainable Territorial Development.

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