

Integrated Multisectoral Research Programme (PIMI). Origins, Trajectories and Horizons



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Abstract The Integrated Multisectoral Research Programme (PIMI), implemented under the coordination of the Faculty of Architecture and Physical Planning (FAPF) of the Eduardo Mondlane University (UEM), is an experience of interaction between research, didactics and institutional capacity, which aims to contribute to the elaboration of a sustainable and participatory model of land analysis and planning for local territorial development. In order to address the criticalities related to Spatial Planning in Maputo Province, mainly with regard to the sustainability of the actions that take place or are carried out in this area, the PIMI started from the assumption that it is only possible to develop such a sustainable and participatory model if these research/didactics/institutional interactions allow a process of capacity-building of decision-making institutions, organizations and enterprises operating in this territory. Such process will occur, thanks to the strong participation of local technicians, through the elaboration of a Territorial Model, which will not only be the graphic expression of the spatial planning for the region under study but will also be a basis for the elaboration of future spatial planning instruments for the region.

1 Notes on the PIMI Programme

The PIMI initiative, pioneered in UEM in linking a study and research activity with two postgraduate courses of different levels, was an opportunity for a first implementation of the Ph.D. Course and the Master Course, both directed to the Territorial Planning of Regions, coordinated by the FAPF itself, which are, therefore, indispensable instruments for the success of the project that also allow training teachers of UEM and professionals.

The methodology designed for the effective operationalization of the PIMI in the field, where ‘the participation, from the initial phases of the programme, of government entities and representatives of economic associations of category will

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be essential', took into account, according to the Terms of Reference (Annex 9 to the General Activity Plan of the UEM-Italy cooperation programme),¹ the identification of five major groups of actions, namely, (a) the definition with the Maputo Province Government of a Timetable of actions to be carried out for their initiation; (b) the organization of the launching Seminar of the Integrated Multisectoral Research Programme (PIMI), taking into account the regional and territorial development objectives set by the Government; (c) the organization of integrated planning meetings with the territory actors; (d) organization of public debates on the integrated planning results; and (e) elaboration of the final version of the Territorial Plan and public presentation of the results.

Despite the various constraints that made the operationalization and implementation of the PIMI within the timeframe planned (March 2018/March 2021) unfeasible, as well as the restrictions to prevent the spread of COVID-19, which led to the request for an extension (March 2021/March 2023), the programme is now in a crucial phase of participation by the Government entities. The programme was welcomed by the Provincial Directorates and assumed by the Governor of Maputo Province and his executive, thus allowing the start, according to the Terms of Reference of the PIMI (Annex 9 to the General Activity Plan), of '(...) integration of the UEM in the national territorial planning processes (...)'.¹

2 Contextualizing the PIMI

Mozambique and Italy have decided to establish, under the Agreement signed on 4 March 2011, a 'Fund for Applied and Multisectoral Research' (FIAM), as part of the 'Support Programme to the Eduardo Mondlane University (UEM) for academic reform, technological innovation and scientific research' funded by the Italian Government and integrated in the UEM Strategic Plan.

The Technical Annex to that same Agreement defines that part of the fund 'will be used to finance a multidisciplinary research finalized by the territorial development of a rural area of Mozambique, identified in consultation with the Government, which should focus in orientate the investments, public and private, necessary for the successive development phase'. This is how the Integrated Multisectoral Research Programme (PIMI) was designed, whose Terms of Reference (Annex 9 to

¹ In order to implement the Eduardo Mondlane University (UEM) Support Programme for academic reform, technological innovation and scientific research, financed by the Italian Government and integrated in the UEM Strategic Plan, a Cooperation Agreement between Mozambique and Italy was signed on 4 March 2011. Under this Agreement, a Fund for Applied and Multisectoral Research (FIAM) was set up to promote the quality and relevance of scientific research carried out by the UEM. The Technical Annex to the Cooperation Agreement defines that from this fund ... a part will be used to finance a multidisciplinary research finalized to the territorial development of a rural area of Mozambique.... Finally, the Annex 9 to the General Activity Plan of the UEM Support Programme defines the Terms of reference for the implementation of the Multisectoral Integrated Research Programme (PIMI).

the General Activity Plan) emphasize that one of the assumptions of this cooperation programme is the ‘integration of UEM in the national processes of territorial planning, economic development and production/transfer of technologies applied to innovation and productive diversification, which valorise the natural resources complex of the country’ (ibidem). The Terms of Reference of the PIMI also define that the motto of the programme as the ‘valorisation, preservation, sustainable use of environmental and territorial resources for which the UEM should be able to strengthen its analysis, research and intervention capacities, as an instrument for the promotion of investments’ being the PIMI ‘the first attempt of the UEM as a whole to propose itself as the main instrument of local sustainable development, coordinating itself with the actors that act in various ways in the territory and proposing innovative, non-bureaucratic, participative, pragmatic and based on scientific knowledge of the same territory’ (ibidem).

The first criterion used for the choice of the “study area” was the ‘existence of research infrastructures of UEM and other public actors, together with ease of access’ which decisively limited the area to Maputo Province. The second criterion was ‘the presence of important communication, transport, water supply and energy infrastructures, easily accessible, in areas that, due to their geographical position and logistical facilities, are attractive to international investments and, at the same time, inserted in a logic of cross-border development’ (ibidem), which initially limited the area to the districts of the south-western part of Maputo Province, namely, Boane, Moamba and Namaacha (as shown in Fig. 1). However, the first interaction with the Government showed the need for the study to proceed taking into account the territory of the province. Therefore, the first territorial based inventory elaborated by

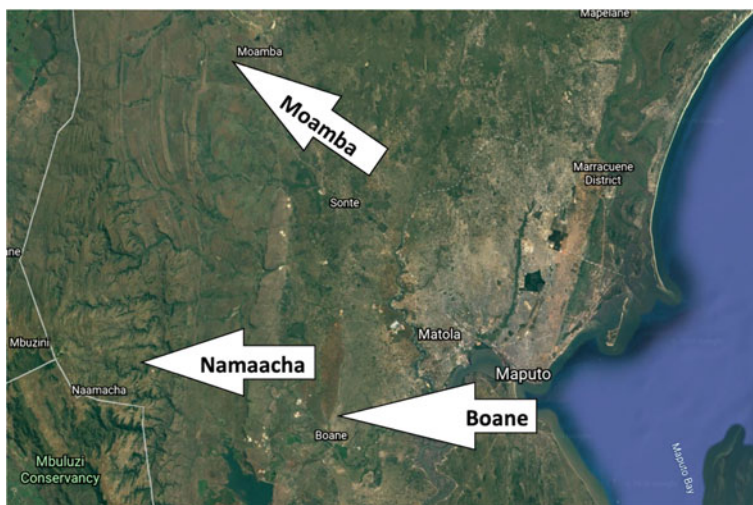


Fig. 1 The territory initially chosen for PIMI: the Boane, Namaacha and Moamba region. *Source* elaboration by the authors on Google Earth image

FAPF under the PIMI implementation was extended to the whole Maputo Province with the objective to build a spatial database for a reading of the ongoing planning processes in the territory.

3 Research Methodology and Scope for the Implementation of PIMI

Based on the Terms of Reference (Annex 9 to the General Activity Plan), the FAPF proposed in 2016, with a view to the implementation and operationalization of the PIMI, to carry out a study called ‘Study for the promotion of the integrated territorial development of the region of Boane, Moamba and Namaacha’ and signed with the UEM the respective memorandum based on the project document finalized in 2018, taking into account both the collaboration of various bodies and specialties of the UEM (economics, law, social sciences, humanities, engineering, etc.) and the participation of international partners (DASu, Politecnico di Milano).

In the project document, besides the support to the government in the elaboration and implementation of spatial planning instruments at this level, the FAPF also considered the significance to integrate in the PIMI the training of professionals and researchers to deal with the phenomenon of development of metropolitan areas and regions.

Combined with the Technical Annex to the Cooperation Agreement and the Terms of Reference (Annex 9 to the General Activity Plan), the project document prepared by the FAPF to materialize the aforementioned “Study” defines the overall objective of the PIMI as ‘develop a multidisciplinary research finalized to the territorial development of a rural area of Mozambique, identified in consultation with the Government, which should undertake to channel the investments, public and private, necessary for the successive development phase’² (FAPF 2016, 2018) and as Specific Objectives:

1. ‘to engage the different components and scientific and organisational competences in the design of a sustainable and participatory model of analysis and planning of the territory for local development, experimenting and applying new methodologies of intervention and study-action’³;
2. ‘to contribute to the integration of UEM in the national processes of territorial planning, economic development and production/transfer of technologies

² The general objective of the PIMI is defined on the basis of the Technical Annex to the Mozambique-Italy Agreement, which defines that part of the FIAM will be used for specific research activities, while a second part will be used to finance a multidisciplinary research aimed at the territorial development of a rural area of Mozambique, identified in consultation with the Government, which shall undertake to channel the public and private investments necessary for the successive development phase.

³ The first specific objective of the PIMI, presented here, is a reformulation of the also first specific objective expressed in the project document elaborated by the FAPF.

- applied to innovation and productive diversification, which enhance the natural resources complex of the country'⁴;
3. 'develop a project for territorial development, together with government institutions and cooperation partners for possible funding, including funds allocated by the Government to district development'.⁵

4 The Procedures for the Operationalization of the Study Objectives

From the project document of the "Study" (FAPF 2016, 2018), for the operationalization of the PIMI and to achieve the objectives, one can enumerate the various activities closely linked to the Objectives of the "Study". Under the general objective (promotion of partnerships and investments), it is intended not only to 'conduct a multisectoral and multidisciplinary study aimed at promoting the territorial development of an area emblematic of the socio-economic dynamics that characterize the expansion areas of the largest urban centres in Mozambique, integrating knowledge about the territory at a regional scale to better understand the phenomenon and the processes involved (of socio-economic, political, cultural and environmental nature)', but also to 'elaborate an intervention model open to all possible types of partnership with the actors who interact with the territory, with the objectives of integrating and optimizing resources, and testing new working methodologies'.

In the same "Study", in the scope of study and research, seven activities are identified:

1. Develop research for the elaboration of the planning model and of a hypothesis of integrated territorial-based development plan of the area under study.
2. Implement a critical approach to the sectoral and isolated development of the territories as well as the absence of a metropolitan consciousness (Macucule 2010: 11) through the application of a research strategy based on the concepts of collaborative governance (Melatto et al. 2019: 1)⁶ with a view to sustainable

⁴ The second specific objective of the PIMI, is also the second objective expressed in the project document prepared by the FAPF.

⁵ The third specific objective of the PIMI is also defined on the basis of the Technical Annex to the Mozambique-Italy Agreement signed on 4 March 2011 for the implementation of the UEM Support Programme for academic reform, technological innovation and scientific research where it is stated, regarding the PIMI that The expected result at the end of the Italian Cooperation support will be a territorial development project, to be presented to the government institutions and the community of cooperation partners for possible funding, including the funds allocated by the Government to district development.

⁶ The authors, in a work aimed at systematizing studies and synthesizing existing theories on the topics of governance and smart and sustainable cities, present reflections and proposals based on the concepts of governance, collaborative governance, governance for sustainable cities and collaborative governance for smart and sustainable cities. The authors (citing Emerson et al. 2011; Healey 2015) consider the public and private sectors as the main stakeholders in collaborative governance where these actors come together to engage in consensus-driven decision-making.

development where it is assumed that ‘the participation of different groups strengthens the design of sustainable and smart cities’.

3. Emphasize the socioeconomic and institutional microdynamics in the context of ongoing territorial transformations in the study area without losing sight of the structural phenomena arising from globalization, namely, migratory flows (Campos and Canavezes 2007: 96; Feijó 2017: 13), capital mobility (Sassen 2001⁷ in Sassen 2005: 35), greater knowledge of information technologies (Castells 2007: 67⁸ in Almeida 2009: 17; Macucule 2015: 153) and cultural (Macucule 2015: 20; HomeSpace 2012⁹ in Macucule 2015: 303).
4. Develop the research considering and understanding both the notions of metropolis and the phenomenon of metropolization underway in the Maputo Region (Macucule 2010: 24). According to Ascher (1998) in (Macucule 2010: 24) the phenomenon of metropolization can be broken down into three logics: a Territorial Logic where the “spatial dynamics” of urbanization integrate the metropolization process; a Competitiveness Logic where the “economic dynamics” can, on the one hand, generate income and wealth, but on the other hand create poverty and socio-spatial problems including the degradation of the physical space; a System or Network Logic characterized by a “global dynamic” starting from the assumption that, according to Castells (2007: 520) in (Macucule 2010: 24), ‘due to the nature of the new knowledge based society, organised around networks and partially formed by flows, the informational city is not a form, but a process, a process characterized by the predominance of the space of flows’.
5. Develop in-depth research on the phenomenon of metropolization occurring in the region of Boane, Moamba and Namaacha so that this event becomes known and within the agenda of land use and planning in Mozambique.
6. Contribute to make clearer the management of these territorial realities in the current political and spatial planning culture.
7. Deepen and advance the knowledge about metropolization through the understanding of hybrid territorialities that articulate the urban and the rural, the

⁷ Sassen (2001) *The Global City: New York, London, Tokyo*. Princeton, New Jersey: Princeton University Press. (Originally published in 1991).

⁸ Castells (2007) *The Networked Society. The information age: economy, society, and culture*. V. 1, 10a ed. Translation: Roneide Venancio Majer. Updated by Jussara Simões. São Paulo: Paz e Terra, 698 (Originally published in 1996).

⁹ (www.homespace.dk) The research programme ‘Home Space in African Cities’ (2009–2012) was funded by the Danish Council for Independent Research under the management of Prof. Jorgen Eskemose Andersen of the Copenhagen School of Architecture. The programme was based on a conception and research project by Prof. Paul Jenkins of the School of the Built Environment, Heriot-Watt University/Edinburgh School of Architecture and Landscape Architecture, University of Edinburgh. It was implemented in partnership between the above institutions (led by Professors Andersen and Jenkins) and the Centre for African Studies at the University Institute of Lisbon (ISCTE)—represented by Dr. Ana Bénard da Costa—as well as the Centre for Habitat Studies and Development (CEDH) at the Faculty of Architecture and Physical Planning (FAPF) of the University Eduardo Mondlane, Mozambique—represented by Profs. Julio Carrilho, Luis Lage and Carlos Trindade.

formal and the informal, in a relational logic that emerges as a continuum that must be taken into account in the process of delimitation and management of these territorial realities.

Without neglecting to analyse the discontinuities that sometimes characterize the extensive urban field, ‘making its crossing impossible and denying any possibility of continuity of meshes and development of logics of proximity’ (Portas et al. 2011: 172), those ‘protected environments, through which one does not pass and which we must bypass’ (Mangin 2004: 330 in Portas et al. 2011: 172); and also without failing to analyse in depth the extensive urbanization phenomenon because it does not always contemplate the particularities of the rural, giving an idea of a continuum that actually does not occur, when it is more about an urbanization in the rural and not an urbanization of the rural (RUA 2002 in Ferreira et al. 2014: 495).

In turn, the objective regarding the integration of the UEM has five activities which are:

1. Academic and professional capacity building of the participants in the activities, which will have as output the activation of postgraduate courses and the training of specialists in territorial planning at a higher level;
2. Contribute to the launch of metropolitan planning in the political and scientific agenda of the country and contribute to the deepening of universal knowledge on the phenomenon of urbanization in the context of new ruralities and urbanities as a peculiar issue of the case study;
3. Contribute to the improvement and elevation of the planning and spatial planning culture in the areas and regions subjected to conurbation phenomena and to the transition to metropolitan regions, through the improvement of the legal framework, the public policies and the plans;
4. Improve the day-to-day practices of management and administration of the territory at the level of the study area;
5. Develop an integrated research plan with the didactic activities of the Master’s and Doctoral programmes where the Doctoral and Master’s students will be part of the Research Lines of the PIMI¹⁰ according to the thematic in which their thesis or dissertation is inserted.

Finally, the objective related to the territorial development project is also summarized in five activities which are:

1. Integration, participation and engagement of the various actors (Stakeholders) interested and active in the territory under study in the different phases of the research, namely, Economic Associations, NGOs, Civil Society, Community Groups, etc.;

¹⁰ The research is composed of five research lines, namely, Economy and Territorial Development, Spatial Planning and Management, Socio-demographic and Socio-territorial Dynamics, Governance and Public Policies and Environment and Sustainability. The Research Line is composed of the following researchers: Principal Investigator; Other Researchers; Doctoral Students; Master Students.

2. Develop a common, intermunicipal and interdisciplinary approach to planning issues taking into account that the metropolitan territory under study is continuous and there is an intense connection between the urban poles of Boane, Moamba and Namaacha, translated into great connectivity, flows or areas of influence that ignore administrative boundaries;
3. Propose urgent actions that promote integrated and sustainable development in the use of its potential in its various dimensions, creating conditions for the emergence and implementation of new economic activities and optimization of investments already made and/or to be made in order to safeguard current ecological interests and those of future generations;
4. Propose strategies that aim to promote harmonious and balanced economic and social development (Law 19/2007 of 18 July, on Spatial Planning in Mozambique);
5. Present results that can serve as an important tool for the region in the identification of new poles of development and guidance for its adequate and sustainable growth, establishing norms and criteria for occupation, clarifying the rights and expectations for development of the various sectors and actors.

5 Achieved Results

5.1 The Boa_Ma_Nhã Initiative

Within the framework of the Memorandum of Understanding between the FAPF and the Department of Architecture and Urban Studies (DASU) of the Politecnico di Milano, the ‘study for the integrated territorial development of the Boane, Moamba and Namaacha regions’ was developed and finalized. The study, with funding from the “Polisocial Award 2018” aimed, among several aspects, at a contribution to the already ongoing PIMI with the aim to fill knowledge gaps and co-produce new knowledge. In June 2020 the final reports of this study were completed namely: fieldwork mission report; assessment report; planning tools report; WEF (Water-Energy-Food) case studies report; Polisocial development plan report that in its part 1 contains the territorial guidelines and scenarios articulating the WEF nexus in the Greater Maputo Region and in part 2 a local development project for Namaacha (Montedoro et al. 2020).

5.2 Assessment and Accreditation, and Commencement of Masters and Ph.D. Courses

Following the assessment of the courses by CNAQ (National Council for Quality Assessment of Higher Education) the “Declaration of Prior Accreditation” were issued on 19 December 2019 for the Master’s Degree and on 16 June 2020 for the

Doctoral Degree. Both courses started on 17 August 2020 through the Zoom platform in order to avoid the spread of COVID-19, a constraint turned into a challenge. It was not foreseen that the courses would occur online, but it had to be, with use of the Zoom platform and some modules that should have been separate were carried out simultaneously with Doctoral and Master's students, enforcing the fact that the Professors were the same.

5.3 Initiation of Field Reconnaissance by Students

The first field expedition to the territory of Boane, Moamba and Namaacha, as well as Goba, organized for the students of all courses, was held on 12 December 2020. This expedition, organized with the support of the lecturers of the "Sustainability and Environment" module, had as the main objective the familiarization of the students with the study area and the observation in the field, of some of the most relevant aspects related to the concepts presented and discussed in the referred module, as well as to understand more in depth all the interactions between the physical environment and the human interventions, which manifest themselves in various ways in this territory. The expedition was organized by three main routes, namely, Maputo-Boane-Goba-Namaacha, Namaacha-Boane-Ressano Garcia and Ressano Garcia-Moamba-Maputo, expecting the students to observe during the routes aspects related to: Dynamics of Urbanization; Type/quality of buildings; Road and rail transport routes; Forms of occupation of agricultural land; Types of vegetation and vegetation cover; Relationship between Geomorphology and occupation of space; Environmental degradation (mining, erosion, buildings, coal production); The Albufeiras (Pequenos Libombos and Corumana).

5.4 The Current Status Report of The Territory of Maputo Province

The first territorial-based inventory denominated Report on the State of Spatial Planning of Maputo Province was concluded in May 2021. This inventory, which aimed to build a spatial database for a reading of the spatial planning processes underway in the territory of Maputo Province, will be discussed in the Workshop for the presentation of the study (Workshop 1) which includes multisectoral participation with different stakeholders to: (a) disseminate the purpose of the PIMI and more specifically the objectives of the research applied within the scope of the study and (b) consolidate the conceptual notes for each thematic area (namely, Territorial Economics; Governance and Spatial Planning; Territorial Development; Socio-Demographic and Socio-Territorial Dynamics; Territory and Environmental Management) having as main result a 'research guide for each thematic area'.

5.5 *Interaction with the Maputo Provincial Government*

The presentation of the PIMI program was welcomed by the Provincial Directorate for Territorial Development and Environment (DPDTA) at the meeting on 14 October 2020 and subsequently taken up by the Governor of Maputo Province and his executive at the Council with all the Provincial Directors held on 8 December 2020, where the FAPF also made the presentation of the PIMI programme. Quoting the Governor and his Directors, below are described the main concerns of this executive, expressed at the referred meeting, namely:

The biggest problem in the province regards land use planning, so the initiative to train technicians in this field is commendable; there is great pressure on land for economic activities. One of the objectives of the province is to elaborate the territorial development plan. It is a unique opportunity: how to discipline the fulfilment of the designed plans. The biggest problem is even the planning of the territory, streets where not even an ambulance can pass. The idea of cooperation is very welcome; investing in human capital, further improving the capacities of officials. We want to be a model in the country as territorial development. The FAPF must use this land for Research; we are open to the PIMI. The organisation of the territory is urgent. We will consider the idea of the Provincial Plan, we will immediately schedule the public launch of the PIMI; we want to sign a memorandum with the FAPF/UEM; we want support for some specific situations such as the section Maputo-Ponta de Ouro as well as the design of the cultural center of Gwaza Muthini. We expect the transfer of knowledge to the technicians involved.

The concerns of the Provincial Executive at the meeting on 8 December clearly showed the need to urgently develop joint actions between the UEM and the Government in order to respond to the challenges arising from the spatial planning activity in the province. These concerns led to the first joint seminar held in the city of Matola (Municipality) on 8 June 2021 and organized through a partnership between FAPF and the Provincial Directorate of Territorial Development and Environment (DPDTA). The seminar on 8 June 2021 was also an opportunity to launch the PIMI in the province as well as the signing of a Memorandum of Understanding between the Government and UEM. The event was attended by the Governor of Maputo Province, His Excellency Júlio Parruque, as well as the Magnificent Rector of UEM, Orlando Quilambo and the Vice-Rector for academic area. All the District Administrators of Maputo Province were present, as well as representatives of the District Services for Planning and Infrastructures and the Municipalities of the Province (Maputo City was not included since it is another province).

6 **Spatial Planning Challenges for the Maputo Province**

The population should be neither “too concentrated” because “the land will collapse” nor “overly distributed” (Alexander et al. 2013: 17). The unplanned and unbridled growth of a city coupled with rapid population growth causes that population to overburden urban areas by increasingly polluting the environment, choking traffic,

depleting water supplies and living in precarious housing conditions (Alexander et al. 2013: 19). Regions and cities cannot grow indefinitely because at some point the very human capacity to manage them is called into question (Haldane 1956¹¹ in Alexander et al. 2013: 11).

The joint seminar held in the city of Matola on 8 June, under the theme ‘Spatial Planning and Climate Resilience towards Sustainable Development’ discussed critical aspects of extreme importance and relevance in the context of spatial planning, aspects which it was clear to all that must be seen as “problems” whose “solutions” must be found to avoid “collapse” derived from excessive “pressure” on urban areas. This “pressure”, originated by the rapid urban and population growth, results in the various problems raised and manifested during the 8 June meeting, namely, the homogenization of self-building, generally caused by the almost non-existent housing provision,¹² which results in the occupation and consumption of vast urban areas with predominantly low-density occupation models, considerably affecting the provision of support services and infrastructures for this population due to the unbearable costs; the proliferation of “condominiums” was also pointed out as an activity that occupies and consumes land with predominantly low-density occupation models, and that their promoters should “diversify the product”; the occupation of environmentally sensitive areas prone to natural disasters, with serious consequences for those who live there and high costs for the state in response and resettlement; the replacement of the practice of preparing and implementing land planning instruments by the act of demarcating plots and subdivisions, often clandestine¹³ and other times eliminating areas with agricultural potential with strong impact on both productivity and the ecosystem of the region and environmental balance (Alexander et al. 2013: 19) as well as the possibility of contact with the countryside (Alexander et al. 2013: 23), leaving as an alternative the weekend outings where cars congest the roads (Alexander et al. 2013: 23); the still existing occupation and urban expansion without any prior land management activity originating urban areas devoid of “order”, often connoted as “informal” occupations or settlements (Trindade, Cani et al. 2006; MICOA 2010; UN-Habitat 2008); the existence of “many” actors in the land management process.

The coordination between the various levels of decision-making was pointed out as one of the actions that can curb the disarray in land use in the territory of the province. The availability of funds for the implementation of actions within the scope of land use planning, the technical capacity building of those involved in these activities and public–private partnerships, were three conditions pointed out as indispensable

¹¹ Haldane JBS (1956). *On Being the Right Size*, The World of Mathematics, Vol. II, J. R. Newman, ed. New York: Simon and Schuster, pp. 962–67.

¹² It was clear from the seminar on 8 June that there are still many questions surrounding the issue of housing: Who should provide housing? How is housing provided? How is it paid for? What is the role and duty of the state?

¹³ In the context of the demarcation of plots and clandestine subdivisions, the provincial governor warned of the existence at the level of the districts of various actors under the designation of topographers who establish landmarks, even georeferenced, but which are not in accordance with the rules of territorial planning.

for the possible and correct materialization of the planned activities as well as the elaborated plans. The governor stated that the planning of the territory in the Maputo Province must know how to respond to the demand for land for industry because the region is an industrial hub, as well as for housing and agricultural production. Governor Parruque also recalled that climate change is a reality and that it is necessary to invest in land use planning to mitigate the impacts of disasters and create resilience. He drew attention to the need to embark quickly on a Rectification Planning that requires a lot of courage to correct current problems and avoid future ones. The Director of the FAPF, João Tique, who also participated in this seminar, recalled that planning the territory is an important activity, fundamental and a priority and that planning the territory is also a task of governance and anticipation. Tique also said that it is necessary to provide the provinces, regions, cities, municipalities, districts, etc., with people trained to deal with spatial planning.

7 The Actions Proposed Under the PIMI Programme

According to the project document prepared by FAPF, annexed to the memorandum signed between FAPF and UEM, it is expected through the study to propose the parameters and conditions of use of natural systems¹⁴ and areas with specific and differentiated characteristics, or with supra-provincial spatial continuities, defined by their ecological characteristics or by economic or social development parameters, or even as a result of natural disasters that require and justify planning interventions

¹⁴ As also referred to in the Regulation of the Law on Territorial Planning (Decree of the Council of Ministers n° 23/2008 of 1 July) A little all over the territory of Maputo province there have clearly been unbridled actions whose effects result in the destruction of natural systems, as is the case of progressive deforestation for the production of firewood and charcoal as well as for family farming, and also mining for the production of aggregates (stone and sand) for civil construction. According to Matsinhe and Soto (2011: 48) in a study by CEAGRE the best alternative to ensure a charcoal production without negative impacts on the sustainability of forests in Mozambique is the adoption of policies that limit access to forest resources, and the reduction of felling rates from the current 0.5% to 0.21%.

at regional level.¹⁵ The aim is to define the nature and limits¹⁶ of the interventions by the authorities,¹⁷ local bodies and municipalities in geographical areas or within economic situations where there are, or may be, temporary or permanent mutual influences. It is intended to contribute with proposals that allow to develop, within the area subject to study, the options contained in the national programmes, in the National Plan of Territorial Development (PNDT¹⁸ 2021) and in the sectoral plans; to translate, in spatial terms, the major objectives of sustainable economic and social development formulated in the provincial development programmes. It also meant to

¹⁵ Another study by CEAGRE in partnership with Winrock International (Siteo et al. 2016, p. 5), in the context of the preparation of the REDD + program in Mozambique with the objective of specifically contributing to the elaboration of the REDD + Strategy, identified in Mozambique 7 direct agents of deforestation and forest degradation, namely, (i) commercial agriculture, (ii) subsistence agriculture, (iii) fuelwood and charcoal, (iv) urbanization, (v) mining, (vi) logging and (vii) livestock, with subsistence agriculture (p. 4) being the agent that had the highest impact for all regions of Mozambique as well as the development corridors; the same study further concluded (p. 32) that for reducing deforestation and forest degradation (DDF) actions such as improved governance, enforcement and land use planning are essential for the implementation of direct actions such as alternatives to shifting agriculture, alternatives to biomass energy, sustained production and efficient use of biomass. REDD + (Reducing Emissions from Deforestation, forest Degradation and enhancement of carbon stocks) is a mechanism that was agreed upon in Bali by the Conference of the Parties (COP) under the United Nations Framework Convention on Climate Change (Siteo et al. 2013).

¹⁶ It is essential to clearly define the role and functions of the various actors who act in the management of a territory, especially vast and constantly expanding territories because, as stated by Alexander et al. (2013: 11) governing becomes increasingly difficult as the size of a region increases. Alexander et al. further refers in this context (in the same p. 11), that if the number of inhabitants exceeds a certain limit, democracy, justice and communication may be jeopardised, and a bureaucracy may be installed, which in the reality of Mozambique's rapidly growing cities results in inefficient assistance for citizens when they seek access to public services, This has been demonstrated in recent times by various phenomena, such as the long queues in public institutions, public transport, health services, banks, etc., where the already annoying response he went to have tea, which citizens often heard when approaching a counter, has gradually evolved into there is no system.

¹⁷ Mafra and Da Silva (2004: 38) define territorial governance as a set of efficient and balanced ways of distributing functions between governmental and non-governmental bodies, both horizontally and vertically, in order to improve the impact of public policies and give the example of the decentralization of territorial governance systems carried out between 1990 and 2000 in many Western countries with reorganization of government functions from the centre, namely, deconcentration, devolution of powers, subsidiarity and budgetary decentralization.

¹⁸ The National Territorial Development Plan (PNDT) performs several primary functions: (i) it makes explicit the strategy and the model for organising national territory; (ii) it provides the basis for the spatial coordination of sectoral policies and for the programming of major public investments with a territorial impact; and (iii) it establishes guidelines and orientations for the definition of the Spatial Planning Policy and for the preparation of other territorial plans (<https://pndt.gov.mz>. Accessed on 15 December 2021).

consider measures tending to attenuate inter-district development asymmetries¹⁹, ²⁰ and to serve as a reference framework for integrated²¹ territorial planning with a view to the economic development of resident communities, through the elaboration of District Plans for Land Use, Inter-municipal and Municipal Plans for Territorial Planning. PIMI also aimed at supporting a more conscious use of the natural resources²² of the region, promoting the rational and integrated development in the province as another strategic objective, as well as to promote the technological²³ intensification of the provincial productive base. The strategic objectives of the PIMI are also to

¹⁹ These asymmetries, according to Alexander et al. (2013 p. 18) can only be mitigated with the introduction of policies that guarantee an equal division of resources and economic development throughout the region, avoiding the worsening of the imbalance between the central (urban) areas and the countryside. In the large urban areas of Maputo Province, the economic gravity force referred to by Alexander et al. (2013) of the large urban centres is remarkable because it is in the city where there is more employment, with the city being increasingly provided with basic services and infrastructure and the countryside and peri-urban areas facing various difficulties.

²⁰ Diniz and Croco (2006: 10–11), referring to the Keynesian perspective and Keynesianism (economic theory developed in the 30 s by John Maynard Keynes 1883–1946, published in his work general theory of employment, interest and money in 1936), as well as the different theories on the centre–periphery relationship influenced by Keynesianism, presents several examples of state intervention to overcome regional imbalances highlighting, for example, the big-push-type investments; the installation, in backward regions, of a driving industry with the aim of activating a growth pole; the targeting of regional policies towards the industrial sector; the creation of compensation mechanisms for backward regions with the implementation of a system of tax incentives to attract companies to these regions; investment in infrastructure in these regions; and, when necessary, restricting some activities in the more developed urban centres, avoiding concentration, diverting such activities to the less favoured regions.

²¹ Mafra and Da Silva (2004: 18) refer that developing a region in an integrated way means, for example, planning a project with multiple purposes to obtain a much higher development than that resulting from piecemeal projects carried out in isolation. In turn Castanho et al. (2018: 2) addressing the state of the art of integrated planning cites Sachs (2004) and Ramos (2012) referring that sustainable development integrates environmental, economic, social, political and cultural issues.

²² It is important and fundamental to ensure that the exploitation of natural resources brings visible benefits to local communities as well as contributing to the integrated development of a region. A study by the Observatory of the Rural Environment—OMR (Serra et al. 2014) concluded on a case study that there are few or no impacts on improving the lives of communities and that there is ignorance by communities of the benefits arising from the 20% of forest exploitation fees, namely Article 102 of the Regulation of the Law on Forests and Wildlife which mentions 20% of any fee for forest or wildlife exploitation is intended for the benefit of local communities in the area where the resources were extracted, under the terms of paragraph 5 of Article 35 of Law No. 10/99 of 7 July. However, Teixeira (2018: 50–55) citing several authors (Unidade de Maneio Comunitário—UMC 1998; Siteo and Tchaúque 2007; Nhamumbo 2004; among others) mentions some examples of projects whose benefits revert to local communities in Mozambique, namely, the Tchuma Tchatu project (developed since 1995 in Mágoe District, Tete Province) where through a Ministerial Diploma the communities and the local government share the revenues from trophy licence fees, and the Chipanje Chetu project (established by the Provincial Government of Niassa, Sanga District) an attempt to replicate the experiences of Tchuma-Tchato whose activities were suspended in 2005.

²³ Teixeira (2018: 26 and 31) recalls that to speak of technology in the productivity of a region is also to speak of planning and in the management of the territory, which means new information and communications technologies (p. 31) and information systems (p. 26). In this context, it is important

ensure sustainable competitiveness²⁴ in the province, to promote social and territorial inclusion²⁵ and to consolidate the environmental protection²⁶ and enhancement system, which includes the areas, values and fundamental subsystems to be integrated in the ecological structure of the area of intervention of the plan.

Consistent with this framework of objectives, the activities directly linked to the doctoral and master's degree courses is expected: through the Ph.D. course, to create and deepen the autonomous capacity in carrying out and coordinating research work, with credible and scientifically based studies, and train scientists capable of giving a highly qualified contribution, in the search and definition of innovative alternatives to design organized and creative spaces in response to the needs of human activity in the field of architecture; study the symbolic and iconographic processes of popular production; organize and create qualified spaces in the wider context of the territory

to draw attention to the importance of Information Technology (IT) as enablers and promoters of efficiency and productivity among different companies and local industry in regions with metropolitan characteristics as referred by Costa and Garcia (2018) in a study on the metropolitan region of São Paulo (Brazil) that aimed to investigate how the externalities produced in diversified regions generate benefits for agglomerated agents. In the same study the authors also cite the work of Jacobs (1969, the economy of cities) referring that the author drew attention to the advantages of large cities and their links with the diversity of the productive structure. Always in the context of the intensification of productivity in Maputo Province, mainly in the context of agriculture, it is also worth quoting Netto (2016: 17–18) in an article on Jane Jacobs in which the author also cites the 1969 book *The Economy of Cities*, saying that Jacobs brings a radical hypothesis proposing the rejection of the idea that agriculture precedes the cities and also proposing that the practice of agriculture develops and intensifies from the demand of the cities that were then emerging. Therefore, being created the conditions in several areas with agricultural potential in Maputo Province, with the presence of water courses, dams, past and current experiences, etc., considerable technological investments for the intensification of production could boost the competitiveness of the region, minimizing imports.

²⁴ Mafra and Da Silva (2004: 29) refer that accentuating competitiveness is the main effect of globalization and that in many countries the success of globalization is associated with decentralization combined with deconcentration in decision-making. However, these authors also point out that the implementation of decentralization cannot be only through legislation but also an effective distribution of powers, competences and responsibilities between central governments, regional and cities and that new types of association between the public and private sectors are also developed.

²⁵ To exclude is almost always connoted with something bad and to include in general means something positive. Therefore, a territory with exclusion and socio-territorial inequalities is a territory that does not give the citizen a chance to participate in integration or in the interests of an integrated development. Analysing social exclusion/inclusion as a territorial fact the author Heidrich (2006: 2) considers social exclusion as a mechanism of loss and mentions some examples, namely, the loss of rights and social guarantees; the lack or lack in terms of education, health, housing, etc.; the exclusion of the possibility to perform work, of the conditions for the reproduction of life; and even the impossibility of the manifestation and exposure of thought in the scope of integration.

²⁶ One of the actions proposed by the National REDD + Strategy in Mozambique (Sitoe et al. 2013) is the establishment of protective forests in areas of fragile ecosystems and recovery of degraded ecosystems. The CEAGRE study in partnership with Winrock International (Sitoe et al. 2016: 25) in turn draws attention to the fact that although policies in general are not in favours of deforestation, practices show the opposite, and that strengthening measures for protecting conservation areas necessarily involves linking policies and practices for exploitation and use of natural resources, but this requires an effort at coordination between institutions, which means defining clear mandates from institutions and ensuring that there is capacity at district level to reduce deforestation.

and the region; through the Master course, and is intended to ensure specialized training acquired in the area of territorial planning, through a qualification that makes them able, as professionals, to integrate or coordinate, in a competent way, teams for the preparation of territorial plans and studies at local or regional level, and acquire technical capacity to fulfil, with critical, comprehensive and multidisciplinary vision, the planning activities.

Other activities will be carried out in order to achieve the expected results, namely, the elaboration of a territorial model (see table below), which will not only be the graphic expression of the spatial planning for the region under study but will also be a basis for the elaboration of future spatial planning instruments for the region; the Elaboration of a Methodological Guide for Regional Planning; the elaboration of a technical guide for the integrated management of the Municipality-District for territorial planning; the launching of the Programme's book(s); the promotion of scientific articles and communications; the promotion of the appropriation of the PIMI results by those responsible for the management of this integrated territory, and other similar ones, namely, politicians and technicians; the promotion of courses and workshops for/with managers of public entities.

FASES DE ELABORAÇÃO DO MODELO TERRITORIAL NO ÂMBITO DO PIMI	
1.	REALIZAÇÃO DA PESQUISA (TEÓRICA e DOCUMENTAÇÃO) para cada area temática, incluindo estudos comparativos em diferentes contextos geográficos e culturais
	1.1. Economia do Território, 1.2. Governança e Ordenamento do Território; 1.3. Desenvolvimento do Território; 1.4. Dinâmicas Sócio-Demográficas e Sócio-Territoriais; 1.5. Território e Gestão Ambiental; 1.6. Organização da Base de Dados Territorial.
2.	REALIZAÇÃO DO TRABALHO EMPÍRICO
	2.1. Compilação e Síntese de Estudos, Projectos, Programas, Planos, Legislação - sobre a região; 2.2. Trabalho de campo; 2.3. Trabalho de gabinete; 2.4. Construção da base de dados.
3.	REALIZAÇÃO DOS PRIMEIROS ESTUDOS ANALÍTICOS (DIAGNÓSTICO) com Participacao e engajamento dos Stakeholders - Identificação e definição dos Grupos Focais
	3.1. Identificação e definição dos Grupos Focais; 3.2. Organização do Workshop de validação dos resultados DOS PRIMEIROS ESTUDOS ANALÍTICOS (DIAGNÓSTICO).
4.	REALIZAÇÃO DAS SINTESES TEMÁTICAS (DIAGNÓSTICO) para Compreensão dos fenómenos e processo
	4.1. Sistema de competitividade (produtividade -- agricola, industrial, logistica, empresarial, etc); 4.2. Sistema Ambiental; 4.3. Sistema de Povoamentos (estrutura Demográfica, rede urbana, habitacao, equipamentos); 4.4. Sistema de Infraestruturas (redes de água, energia, telecomunicações, estradas, etc); 4.5. Sistema de Mobilidade e Transportes; 4.6. Governança - Capacidade Institucional, Gestão e Planeamento Colaborativo.
	Organização dos Workshops de validação dos resultados DAS SINTESES TEMÁTICAS (DIAGNÓSTICO) para discutir CENÁRIOS ALTERNATIVOS bem como o Cenário desejeável/Visão
5.	REALIZAÇÃO DE EXERCÍCIOS INTEGRADOS (DOS CENÁRIOS a VISA0) para Construção do quadro lógico através da análise estrutural para compreensão da interacção dos fenómenos e processos de desenvolvimento territorial
	5.1. Cenários; 5.2. Cenário desejeável/Visão
6.	EXERCÍCIO DE PROSPECTIVA TERRITORIAL
	6.1. Construção do quadro lógico - Opcoes Estrategicas de Base Territorial; 6.2. Definição dos Elementos de Referencia para o MODELO TERRITORIAL e elaboração do MODELO TERRITORIAL.
	6.2. Definição dos Elementos de Referencia para o MODELO TERRITORIAL e elaboração do MODELO TERRITORIAL
	6.2.1. Sistema de competitividade (produtividade -- agricola, industrial, logistica, empresarial, etc)
	6.2.2. Sistema Ambiental
	6.2.3. Sistema de Povoamentos (estrutura Demográfica, rede urbana, habitacao, equipamentos)
	6.2.4. Sistema de Infraestruturas (redes de água, energia, telecomunicações, estradas, etc)
	6.2.5. Sistema de Mobilidade e Transportes
	6.3. Elementos para uma Governança do Território

Elaborado por: Autores, Nov. 2021 (fonte: Faculdade de Arquitectura e Planeamento Físico, 2016 e 2018)

8 Conclusions and Recommendations

The PIMI is a programme that started with the proposal in 2016 of a research project materialized in a project document in 2018, with the intention to contribute to the elaboration of a sustainable and participative model of analysis and planning of the territory, having initially as case study the districts of Boane, Moamba and Namaacha. Today, the PIMI is bringing to the forefront the problems related to Spatial Planning in the entire Maputo Province, especially regarding the sustainability of the actions that take place or are carried out in this area. The participation of the government entities since the initial phases of the programme and the first steps taken towards an awareness of integrated planning with the actors of the territory, allowed not only to interlink a study and research activity with two postgraduate courses, namely, Ph.D. and Master but also to intensify the participation of UEM in the national processes of territorial planning.

These first steps in the province with the involvement of actors responsible for the management of the territory, at various levels, have proven that it is urgent to intensify actions aimed at the enhancement, preservation, and sustainable use of environmental and territorial resources in the province, proposing innovative methodologies based either on empirical knowledge of the same territory or on scientific knowledge. Therefore, it is also urgent to clearly define the nature and limits of the interventions of the authorities of local bodies and municipalities.

Investing in integrated, sustainable and inclusive planning for the region, associated with the presence of important infrastructures of communication, transportation, water supply, energy, etc., will produce positive externalities and bring benefits and advantages due to the diversity of the productive structure created by this integration (Jacobs 1969 in Costa and Garcia 2018).

It is necessary to intensify the training of professionals and researchers to deal with the phenomenon of development of metropolitan areas and regions, and to be able to propose and implement sustainable and participatory models of analysis and spatial planning. It is necessary to provide local bodies, at different levels, with people trained to deal with spatial planning. It is necessary to promote partnerships and attract investments, favourable to integrated territorial development and not to the sectoral and isolated (Macucule 2010 p. 11).

The phenomenon of metropolization occurring in the region must become known and within the agenda of land use and planning in Mozambique. The management of these territorial realities must be clearer in the current political and spatial planning culture. It is necessary to improve and raise the planning and spatial planning culture in areas and regions subject to the metropolization phenomena, through the improvement of the legal framework, public policies and plans.

The emergence and establishment of new economic activities, as well as the identification of new centres of development and their growth, must be planned in a sustainable manner and governed by norms and occupation criteria, with a view to safeguarding the ecological interests of present and future generations.

There must be better coordination between the various levels of decision-making and local government must make better use of the existing capacities and knowledge in the country, find and allocate resources, promote partnerships, to respond to the challenges arising from the spatial planning activity in the Province. Urban areas cannot grow indefinitely and in an unplanned and unmeasured manner, in many cases with non-legal areas and urban expansion without any previous spatial planning activity, resulting in urban areas lacking “order”, which are often connoted as “informal” occupations or settlements. We need to be innovative to cope with population growth that has caused this population to overburden urban areas by increasingly polluting the environment, choking traffic, depleting water reserves and living in precarious housing conditions (Alexander et al. 2013 p. 19). Solutions must be found to avoid the “collapse” derived from excessive “pressure” on urban areas.

The provision of housing, mainly of multi-family character, should be discussed not only as a responsibility of the state but also the state itself as a facilitator, because the current occupation models with predominantly low density and inefficient urban patterns result in the occupation and consumption of vast urban areas, extending cities beyond administrative boundaries (UN-Habitat 2014, 2015) and, in the end, the provision of services and infrastructures to support this population is insufficient and deficient due to the unaffordable costs. It is worth here to quote Figueiredo (2009: 25–26) citing the report *The Cost of Sprawl* (1974) which reports that urbanization of high-density neighbourhoods costs 21% less (after 1000hab/ha the cost increases) than medium-density urbanization and 44% less than low-density urbanization.

Another example presented by Thompson (2013: 5) referring to the case of the Halifax Regional Municipality (capital of the province of Nova Scotia, Canada) that concluded in an estimate in 2005 that the cost per household to urbanize low-density neighbourhoods is more than three times the cost to urbanize high-density neighbourhoods, forcing the Municipality to adopt a regional plan that would accommodate in urban areas 25% of urban growth instead of the current 16%. Thompson also notes that a follow-up study by the same Municipality concluded that \$66 million will be saved by 2031 if this density intensification takes effect and \$715 million would be saved under a 50% scenario.

It is necessary to stop the occupation of environmentally sensitive areas prone to natural disasters, with serious consequences for those who live there, and high costs for the state in the response and resettlement. Many of these areas have agricultural potential and their elimination has a strong impact on both productivity and the ecosystem of the region and environmental balance (Alexander et al. 2013: 19). Climate change is a reality, and the occupation of inappropriate areas will require considerable investment for corrective action to mitigate the impacts of disasters and create resilience.

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