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Sustainable urban planning for the revival and development of an African rural area

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Abstract

Mozambique's problem today is no longer only represented by the exceptional conditions of the emergency (floods, cyclones, epidemics) but by the rapid and uncontrolled urbanization. The paper objective is to determine guidelines that define the potential of an urban planning project for the revival and development of a rural area, through the urban restructuring of a location fallen into disuse. The text describes the application testing of a methodology of investigation, time to outline a cognitive basis to trace possible actions for improvement in respect of the identity of the place. Through the analysis of benchmarks and case studies the urban planning strategy is defined. It envisages the creation of an Ecological Municipal Park, as a tool for the sustainable development of the area, combined with the introduction of a university research centre that allows the restoration of the existing historical buildings. The results show that the establishment of the natural park can be used as guideline for the proper growth of the region, reducing the pressure of Maxixe urbanization process. Also, that the presence of an economic activity in the village improves the social and economic conditions of the surrounding rural communities. The research illustrated is part of the project development and experimentation awarded by the "Polisocial Award" of Politecnico di Milano.

Keywords

Urban planning; Rural area; Methodology; Sustainable development; Environmental conservation

1. Overview

Mozambique is an African fast-developing countries. Before mentioning its characteristics, it is important to have a brief historical review. In recent history the country has lived political turmoil. From 1498 to 1975 it has been a Portuguese colony, but thanks to the Frente de Libertação de Moçambique (FRELIMO), a group of guerrilla fighters supplied by Russia and China, the country gained its freedom after a decade of war (Thompson 2013; Chandler 2014). Only one year after the independence from Portugal, a rebel group named Resistência Nacional Moçambicana (RENAMO) opposed the liberation movement. After the end of the 80s, international supports to both parties ceased, while the country was already in a state of famine and most of its resources were lost. From that point onward, even if the acts of violence didn't stop, a two years peace talk brought to peace on the October 4th, 1992. The number of casualties was hard to estimate, but it can be said that around 100.000 civilians lost their lives, while the overall deaths related to the war range between 600.000 to 1 million (World Peace Foundation 2015). The country which was already in a state of poverty, found itself in a worsened situation. According to a national survey conducted in 2008-2009, among the 26 million of Mozambicans, the

number of people living in absolute poverty has been reduced to 54% from the 70% recorded in 1997. However, most of the rural population still lives with less than 1.25\$ per day and it lacks basic services such as safe access to water, sanitation and schools (IFAD 2014). Anyway, the population is steadily increasing, from the 21,2 million in 2008 it reached 25,7 million in 2015 (Baiardi and Puglisi 2018). A strong indicator of this rapid growth is that 45% of the population during 2015 was under the age of 14 (Instituto Nacional de Estatistica 2016). It is from this fast-paced increase in population that Mozambique must face some of its most critical issues.

From the study on the country's path of development between 2000 and 2005 (Ollivier 2011), it is affirmed that the wealth of Mozambique has been increasing, mainly through human and physical capital accumulation while the pressure on renewable natural capital remains relatively low. Due to the current socio-economic and political context of Mozambique, the situation is critical. Local governments are promoting the sprawled expansion of urbanized areas because of the local government's general absence of a coherent spatial vision, their practices regarding planning, land allocation and regularization, tax collection and enforcement and the corrupt tendencies that generally favor the consumption of new land (IHS 2017). This tremendous urbanization that is spreading all around the country is favouring the creation of slums, in fact in 2009 around 80% of urban population was living in these poor districts (WHO 2014). Even if in the past 20 years Mozambique has recorded an annual average GDP growth of 7%, the rapid population growth, rising inequality and lack of access to basic services and infrastructure means that much of this growth may not benefit the poor. It is forecasted that in 2040 the number of people still living in absolute poverty will be 18,7 million, which is almost the same of today (19 millions) (Porter 2018).

The government is actively fighting against the country's main problems. Some examples are the project WASH regarding the access to safe water, sanitation and hygiene, PAPA to reach food self-sufficiency and IFZ-Industrial Free Zones to promote the exploitation of mineral resources. Regarding property regulations, in Mozambique the land is owned by the State and cannot be sold, borrowed or otherwise disposed of. National land policy has been partially implemented through the Land Law of 1997 and its 1998 Regulations, applicable in rural areas. There are still ways (UN-Habitat 2005) to acquire the right to use and benefit from land (known as DUAT- Direito de Uso e Aproveitamento de Terra) according to law. The current situation of tourism in Mozambique stems from the successful implementation of the "Strategic Plan for Tourism Development in Mozambique (2004-2013)". In 2010, the tourism sector generated 17,690 billion Metical (€ 254.67 million) of turnover, equal to no less than 6.2% of total national income and 5.6% of GDP. The contribution of tourism to the world of work has been modest and is estimated to have generated 45,350 jobs in 2012 (República de Moçambique 2015).





Fig. 1, 2: Erosion of soil in the following typical torrential rains effect of the uncontrolled urbanization (Authorship)

2. Study objective

In this context the authors will deal with the uncontrolled urban sprawling, setting guidelines that define the potential of an urban planning project for the revival and development of a rural area, through the urban restructuring of a location fallen into disuse. The study will focus on a specific rural area of Mozambique and its surroundings, the Jesuit Mission of Mongue in the municipality of Maxixe, Inhambane province. This area has been analysed during the development of the social project Mo.N.G.U.E. (Mozambique Nature Growth University Education) (Politecnico di Milano 2017). In general, the study wants to bring to the attention some general objectives that are considered of most importance by Mozambique.

The peninsula of Mongue develops along an axis approximately 20 km to the north of the town of Maxixe. The peninsula presents some phenomena inherent in a rural context as example: abandonment of the territory, loss of identity of places, lack of care of the environment, etc.

In the first place, there are the great themes of nature, environment and landscape and its conditions of endangered and unexploited potential (AfDB 2015). Mozambique is a developing country and as seen above it relates to the extraordinary theme of growth, a theme that here is meant as development in a qualitative and sustainable way. Another relevant theme that the study wants to follow is that of the university as a major engine of economic and, above all, civil development in the country (Cloete 2011). It is already proved that in developing countries it is of greatest importance to control and put boundaries

to some of the most dangerous consequences of a too rapid growth (Scott 2015). Thus, the fast and unplanned urbanization that is devouring pristine land would be slowed down and supervised. In this paper's study the urban planning strategy envisage the creation of an Ecological Municipal Park in the rural region of Maxixe, as a tool for the sustainable development of the area. The establishment of a protected area will raise a boundary to the urbanization in the region. One step forward in the study is the combination of the protected area with a university research centre that will guarantee the restoration of the existing historical buildings. The choice of the typology of activity to introduce derives not only from the surveys and data acquired, but also from the relevant position that the research centres are having in this moment in Mozambique (Bandeira 2002). The introduction of an economic activity can be of significant impact on the outcome of the analysis, especially when the activity is in line with the principles of sustainability. It would generate a general improvement of the social and economic conditions of the surrounding rural communities. Local people would be involved during the making of the activity and during its functioning, so that their participation would lead to their inclusion. One of the most important benefits of combining an activity and a protected area is that the local communities have direct economic returns, as regulated by Law.



Fig. 3: The Jesuit Mission of Mongue (Authorship)

3. Methodology

The research has led to the development of a model and a survey process aimed to outline the state of fact and draw the possible remedial actions to be taken in respect of the preservation of the identity of the place according to an evolutionary continuity.

The programming of the survey process has resulted in the planning and the processing of working steps which can be summarised as follows: development of relations with the inhabitants and local professionals, thematic mapping, multidisciplinary and analytical interpretation, the definition of a framework of levels and indicators; definition of a strategy of intervention for the study area through a method interdisciplinary design that consider technical, environmental, social and economical feasibility. The first step involves a series of thematic analysisI aimed at defining elements such as: the socioeconomic conditions, the bioclimatic conditions, the system settlements, the structures and the construction techniques of the buildings. These phase foresees also the cataloguing of representative buildings of the main construction typologies scattered on the territory as: homes, buildings for collective use (such as churches and schools), etc.

The processes of information collection are preliminary and supportive to the subsequent activities that are fundamental for the design of future analyses. The process of audit has the duty of gathering information, directions and data that will be used in the decision making for the confirmation or change of details of the strategic objectives (Baiardi and Morena 2009). The more the data acquired the more accurate can be the development of the study. Therefore, the choice of the right information to be used among all the acquired is of outmost importance for achieving the best outcome.

The next phase involves the definition of a strategy of intervention for the study area through the elaboration of a method interdisciplinary design by the outline a synthetic framework of the criticalities and potential of the place (returned in suitable graphs and reports) and to formulate hypotheses demography and spatial solutions (expression of interdisciplinary operated).

This selection opens to the specific project definition, both to the scale of the masterplan that to that of individual buildings, and simultaneously allows a first verification of the methodological approach proposed. The intervention strategy is furthermore completed by feasibility studies and promotion programs. The feasibility study is the document that "presents the strategic objectives of an initiative of development or to develop real estate/territorial".

In the process of choosing the right information using a set of benchmarks has eased the duty. Benchmarking is a comparison that aims at increasing the efficiency and effectiveness of resource use. Whenever finding the appropriate information is not possible the introduction of benchmarks can lead to the estimation of that information. Checking data gathered from an analogous context, it is easy to find the average value of the required info, which can be used as reference for the study. One of the most critical features of benchmarking is the object definition, in other words the information that is needed. Another criticality is the time required by the data gathering. A careful investigation requires many hours of work, so a reduction of the number of references to be analysed could greatly reduce the task (Mangiarotti and Tronconi 2010).

While the data are being gathered, a preliminary analysis can be done before starting with a deeper research for information (Helms 2010). It is important to understand the current situation but also future changes that could affect the development or the success of a project. The SWOT analysis can be used to achieve this objective. The procedure to follow (Harrison 2010) is to first analyse key data gathered previously so that the current performance can be assessed. Then it is possible to divide them into internal (strengths and weaknesses) and external (opportunities and threats) factors. The confrontation between the positive and negative features leads to a go or no-go decision. If the result is positive the last step involves incorporating the SWOT analysis into the decision-making process to determine which project alternative best meets the strategic plan.

After the preliminary overview of the investment and the collection of the required data, the economic analysis of the project can take place. The most known and most widely spread method has been used, namely the Discounted Cash Flow Analysis (DCFA). It is a flexible method that can be used in many circumstances, moreover it is possible to easily combine it with other tools used in the evaluation of an investment (Borghi 2009). I will be used a range of discount rates from 5% to 20% to better assess the possible outcomes of the project and its reproduction in similar contexts. The time frame goes accordingly to the project perspective. In the study the authors opted for a 10years time frame.

Finally, it is possible to estimate the benefits that the project success will generate. All these advantages are listed and classified according to the three pillars of sustainability (Kuhlman 2010). The methodology can be used as guidelines to define the potential of an urban planning project, that are the improving benefits generated, for the revival and development of a rural area.



Fig. 4: Partial example of return the state of fact, building with 2 classrooms indoors and one outdoor, scale 1:200, processing of Luca Faverio

4. Monitoring Model

Working for the objectives is necessary the introduction of a model of monitoring of the activities carried out to evaluate the quality of the work carried out and the reachability or less objective. Concretely means to draw, by means of the identification of precise "in thou sayest, the results of the actions performed, to compare these results with the parameters of reference (benchmark) dictated by the market, from the previous exercises and by the reference target agreed with the property, evaluating the departs minds (positive and/or negative) for possibly reschedule, correct or improve the "management plan" originating. "Data" on the effectiveness of design will be evaluated through the use of quantitative indicators and qualitative parameters that are served to build methodologically the analysis and that, accordingly, are the founding track of the project.

Some aspects are verifiable through the use of indicators of quantitative type commonly used such as dimensional indicators (metric for surfaces and volumes), Environmental (Predicted Medium Vote for the thermal comfort), energy (kWh for consumption levels) and economic (monetary for costs and annuities). These elements find their potential for verification through: diagrams and charts of comparison between the state of fact and project.

Take this logic however involves the effort to be able to associate the main characteristics (uniqueness, physicality and immobility) of immovable property to the elements of the mathematical type and financial.

Some aspects are verifiable through the use of indicators of quantitative type commonly used such as dimensional indicators (metric for surfaces and volumes), Environmental (Predicted Medium

Vote for the thermal comfort), energy (kWh for consumption levels) and economic (monetary for costs and annuities).

4.1 Data recognization

Most of the data regarding the village and its surroundings were gathered during two on-field surveys made by the Universities Politecnico di Milano and UP Maxixe. Approximately 80% of the area is covered with vegetation. The abundancy of mangroves bestows on the region the status of special protection area in compliance with the environmental law 20/97 October 1st. The buildings of the old mission of Mongue are all historical buildings from the Portuguese colonial period, built at the beginning of the 20th century. Nowadays they are in a state of advanced decay, especially the old church of Sao José, and are in extreme need of restoration. The functions of the other buildings are a school, a kitchen and a refectory. All of them are used by people who live nearby, as a matter of fact none lives in the old part of the mission.

Other relevant data gathered during the study is regarding the functioning of the village and the research centre activity to be introduced. Construction costs, necessary vehicles and gasoline costs, employees' wages and potential revenues were taken in consideration.

Some of the information were estimated through benchmarking process. Construction costs were calculated as the mean value of similar social project carried out in rural areas of Mozambique (Ce.Svi.Te.M 2006-2011) as shown in Figure 5.

А	verage construc	tion cost per m	2
Buildings	Expense [€]	Surface [m ²]	Expense [€/m ²]
Building α	28457.91	206	138.15
Building β	42297.83	416	101.68
Building γ	18038.96	101.50	177.72
MEAN	29598.23	241.17	139.18

Fig. 5: Average construction cos per qsm (authorship)

The potential revenue has been estimated thanks to the analysis of accommodations close to research centres. The benchmark used, and their rates are reported in Figure 6.

Bench	mark rates	summary			
Accommodation	Rate [€]	N° guests	Rent [€/guest		
Resort α					
Double room	31.26	2	15.63		
Resort β					
Double room	40.68	2	20.34		
Resort y					
Premium villa	237.92	4	59.48		
Villa	218.72	4	54.68		
Premium bungalow	131.06	2	65.53		
Standard bungalow	106.02	106.02 2 53.01			
Garden rooms	89.32	2	44.66		
Equipped tent	58.44 2 29.22				
Resort δ					
Beach house	150.63	8	18.83		
Beach house	ch house 123.24 6 20		20.54		
Bungalow	alow 102.70 6 17.12		17.12		
Bungalow	v 82.16 4 20.54		20.54		
Camping	8.90 1 8.90				
Resort ɛ					
Twin room	41.00	2	20.50		
Flat	49.00	3	16.33		
House	205.00	10	20.50		
Resort ζ					
Chalet	85.00	0 2 42,50			
Chalet	170.00	4	42.50		
MEAN	107.28	3.67	31.71		

Fig. 6: Example of benchmark rates summary (authorship)

The research centres taken as comparable are Edward O. Wilson Lab in the Gorongosa National Park, Estação de Biologia Maritima da Inhaca on the Inhaca island and the Zavora Marine Lab located south of Inhambane in the Zavora Bay. During the calculation some corrective coefficients were used on parameters such as distance from the research centre and whether the structure is inside or outside a protected area.

4.2 SWOT Analysis

When the assessment of the current situation is concluded, and the data gathered, it is possible to create a SWOT analysis. All the information lead to the definition of the relevant positive and negative characteristics of the area and of the project possible outcomes. This tool helps in deciding which are the features to be exploited and what to prioritize in the risk management strategy against future changes. The positive result of the SWOT analysis is a strong support to the hypothesis of creating. Strengths and opportunities detected during the analysis outweigh the weaknesses and threats (Erhard 2005).

The main current strengths can be recognised as the uncontaminated nature and the presence of historical buildings. The opportunities that the project bears are multiple, but the most important are the sustainable development of the region, the creation of jobs and the general socio-economic improvement of the area. On the opposite greatest weaknesses found are the lack of adequate services in the area, the crumbling state of the buildings in Mongue and the difficulty to reach the place. Among the threats there are the strong inflation of the country and the failure in involving foreign universities and researchers.

4.3 Economical Analysis

The Discounted Cash Flow analysis (DCF) is the main instrument of economic planning and financial project. Its principle is based on the analysis of the cash flows outgoing and incoming projected along an arc predetermined time that corresponds to the life cycle of the investment. Through the business plan you can define the CapEx (Capital Expenditure) i.e. the forecast expenditure for the lifetime of the investment and the number of years needed to amortize the total investment supported (pay-back period) (Baiardi, 2010).

The economic feasibility of the project will be evaluated through indicators such as, for example: NPV (Net Present Value) i.e. discounting of all positive and negative cash flows that characterize

the project. Net Present Value (NPV) expresses the incremental wealth that investors expect to gain from an investment opportunity as if it is immediately available.

The Internal Rate of Return (IRR) is the rate that mathematically makes the NPV equal to zero.

IRR of the project useful to compare the assumptions of project alternatives) and periods of repayment of the investment (pay-back period).

Payback Period (PP) states how many periods are necessary for the positive cash flows to cover the investment and potential negative cash flows. PP can also be seen as the break-even point of the investment, after PP the positive cash flows are the profit that the investment will generate.

Discounted Profitability Index (DPI) is a secondary index that measures the efficiency of the resources used. It can overcome the lack of the NPV in considering the size of an investment.

					Net Presen	t Value					
Year	0	1	2	3	4	5	6	7	8	9	10
Functioning	0%	15%	40%	70%	90%	100%	100%	100%	100%	100%	100%
Construction	-259.330€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€
Maintenance	0€	0€	0€	0€	0€	-12.967€	-12.967€	-12.967€	-12.967€	-12.967€	-12.967€
Wages	0€	-16.294€	-16.294€	-16.294€	-16.294€	-16.294€	-16.294€	-16.294€	-16.294€	-16.294€	-16.294€
Transportation	-60.000€	-167€	-445€	-779€	-1.002€	-1.114€	-1.114€	-1.114€	-1.114 €	-1.114 €	-1.114 €
Rent	0€	19.261€	51.362€	89.883€	115.564 €	128.404 €	128.404 €	128.404 €	128.404 €	128.404 €	128.404 €
CF	-319.330€	2.800€	34.622€	72.809€	98.267€	98.030€	98.030€	98.030€	98.030€	98.030€	98.030€
CF (80%)	-319.330€	2.240€	27.698€	58.247€	78.614€	78.424€	78.424€	78.424€	78.424€	78.424€	78.424€
DCF (80%)	-319.330€	2.036€	22.891€	43.762€	53.694€	48.695€	44.268€	40.244€	36.585€	33.259€	30.236€
NPV	-319.330 €	-317.294€	-294.404€	-250.641€	-196.947€	-148.252€	-103.984€	-63.740€	-27.154€	6.105€	36.341€

Note: Discount rate = 10%; CF (80%) and DCF (80%) means that 20% of the cash inflow has been donated to local comunities

Fig. 7: Example of Calculation of the Net Present Value (NVP) by Discounted Cash Flows analysis (DCF) at 10% discount rate if investing in a research centre inside a protected area (authorship)

5. Conclusion

The expected result is the definition of a masterplan outlining a precise plant settlements that can improve the conditions of the place, of the landscape and the system of open spaces and the definition of a design of the individual buildings capable of improving relations between the internal space and the outside, the conditions of bio-climatic comfort and energy sustainability, with definition of the construction techniques.

Among the many benefits evaluated there are a few under the "environmental" category that are essential in the process of stopping the uncontrolled sprawling of Mozambican urban areas. Setting up the Municipal Ecological Park of Maxixe guarantees the protection of the territory and its inhabitants. It will be possible to set rules and regulations on the new buildings in the area. With new boundaries to irresponsible construction it is possible to prevent the destruction of uncontaminated land, especially the one with strong cultural relevance for local population, such as the two sacred forests in the area.

With regard to the indicators used for the impac As the study pointed out, its success is going to benefit the local population with new jobs, better basic services, and yearly donations from the businesses within the protected area.

The guidelines proposed by the authors are based on concern for the endangered environment. In this specific case the danger comes from the urbanization of Maxixe and the inability of the government to apply the necessary policies in order to prevent its uncontrolled sprawling. We have seen how the main authority are still ineffective due to inappropriate policies

The results suggest that if successfully applied, with proper previous analysis, this solution can generate a great improvement for a rural area, safeguarding the natural resources, local culture and traditions. In addition, all of this can be achieved while maintaining the sustainability of the project and guaranteeing a future sustainable development of the area and its surroundings.

Benefits deriving from the project success
Social
Restoration and enhancement of the mission facilities at disposition of
local people: school, canteen and church.
Creation of 17 new job positions for the whole year.
Improvement of general conditions of the surrounding area.
Improvement of the services currently present in the area.
Improvement of the infrastructure system connecting Mongue with
Maxixe.
Introduction of an elecricity system.
Creation of a reference point for local population.
Creation of an international educational meeting point.
Creation of an exchange of information and resources network
between universities.
Collaboration with other facilities in the area or acquisition of external
services from the community.
Construction of a small dock that will connect Mongue directly to
Inhambane and to ther villages across the river.
Environment
Creation of the Municipal Ecological Park of Maxixe, a project proposal
made by the Universidade Pedagógica - Maxixe.
Put a stop to the uncontrolled sprawling of urbanised areas.
Creation of environmental regulations in the area.
Constant monitoring of the environment guarantees a prompt
reaction to new arising issues.
Protection of flora and fauna in the area surrounding the research
center.
Monitoring of the bay ecosistem and protection from excessive fishery
and use of illegal methods (e.g. explosive).
Introduction of sustainable source of energy and of an electricity
system that will lower the increasing use of wood as the main source
of energy.
Economic
Introduction of a new economic activity in the area.
Yearly average profit coming from rent and other services offered
during the touristic season is estimated to be around €90.000.
The initial investment is expected to be recovered in less than 5 years
and 6 months.
During the calculation of the investment Net Present Value, the use of
a discount rate smaller than 14,69% resulted in a positive outcome of
the analysis .
The underlying hypothesis of being inside a natural reserve guarantees
a donation equal to €20.000 to support local communities.
Exploitation of every period of the year, maximising the use of the

receptive structure.

Bibliographical References (Arial – 11 pt – Lower case letters - Bold – Left aligned)

 AfDB, African Development Bank. (2015), "Transition Towards Green Growth in Mozambique – Policy Reviews and Recommendations for Actions." https://www.afdb.org (July 15, 2017)
Baiardi, L., Morena, M. (2009), Marketing Territoriale. Strategie per la riqualificazione, la

[2] Baiardi, L., Morena, M. (2009), Marketing Territoriale. Strategie per la riqualificazione, la valorizzazione e la promozione del territorio: esperienze e tendenze in atto, Milan, Italy.

[3] Baiardi, L., Puglisi, V. (2018), "Progetto MONGUE per lo sviluppo sostenibile del Mozambico." in press.

[4] Baiardi, L. (2010), "La valorizzazione e il concetto di redditività degli immobili", in Tronconi, O. and Baiardi, L., Valutazione, valorizzazione e sviluppo immobiliare, Maggioli editore, Milano, pp. 61-102.

[5] Borghi, A. (2009) Finanza immobiliare, Milan, Italy.

[6] (2006), "Centro Esperança" https://www.cesvitem.org/it/pvs/report-finale-progetto-centro-esperanca.asp (July 17, 2017)

[7] Ce.Svi.Te.M. (2011), "Scuola Primaria di Carapira" https://www.cesvitem.org (July 17, 2017)

[8] Chandler, D. L. (2014), "Mozambique Gains Indipendence From Portugal On This Day In 1975." Face2Face Africa, June 25, Politics.

[9] Cloete, N., Bailey, T., Pillay, P., Bunting, I., Maassen, P. (2011), Universities and Economic Development in Africa, Centre of Higher Education Transformation (CHET), Cape Town, South Africa [10] Harrison, J.P. (2010) Essentials of Strategic Planning in Healthcare, Chapter 5. Strategic planning and SWOT analysis, pp. 91-97, Chicago, Health Administration Press.

[11] Helms, M. M., Nixon, J. (2010) "Exploring SWOT analysis – where are we now? : A review of academic research from the last decade," Journal of Strategy and Management, 3(3), 215-251.

[12] IFAD (International Fund for Agricultural Development). (2014), "Investing in rural people in Mozambique."

[13] IHS (Institute for Housing and Urban Development Studies of Erasmus University Rotterdam). (2017), "Urbanization in Mozambique – Assessing Actors, Processes, and Impacts of Urban Growth."

[14] Instituto Nacional de Estatistica (2015), Anuário Estatístico 2015 - Moçambique, Instituto Nacional de Estatistica, Maputo, Mozambique.

[15] Kuhlman, T., Farrington, J. (2010) "What is sustainability?," Sustainability, 2(11), 3436-3448. http://www.mdpi.com/2071-1050/2/11/3436/htm> (Mar 22, 2018)

[16] Mangiarotti, A., Tronconi, O. (2010) Il progetto di fattibilità. Analisi tecnica-economica e sistemi costruttivi, Milan, Italy.

[17] Ollivier, T., Giraud, P. N. (2011), "Assessing sustainability, a comprehensive wealth accounting prospect: An application to Mozambique." Ecological Economics, 70(3), 503-512.

[18] Porter, A., Bohl D., Kwasi S., Donnenfeld Z., Cilliers, J. (2018), "Prospects and Challenges: Mozambique's Growth and Human Development Outlook to 2040."

[19] República de Moçambique. Ministèrio da cultura e turismo (2015), "Plano Estratégico para o Desenvolvimento do Turismo em Moçambique (2016-2025)." República de Moçambique - Ministèrio para a coordenação da acção ambiental (2014), "Estudo sobre a Análise de Instrumentos

[20] Scott, J. (2015), "The risks of rapid urbanization in developing countries." https://www.zurich.com/en/knowledge/articles/2015/01/the-risks-of-rapid-urbanization-in-developing-countries (June 14, 2017)

[21] Thompson, D. A. (2013), "Constructing a history of independent Mozambique, 1974-1982: a study in photography." Kronos, 39(1), 158-184.

[22] UN-Habitat (United Nations Human Settlements Programme). (2015), Towards an African Urban Agenda, Nairobi, Kenya.

[23] WHO (World Health Organization). (2014), "Mozambique. Urban health profile" http://www.who.int/kobe_centre/measuring/urbanheart/mozambique.pdf> (June 11, 2017).