

Research Article

Optimizing Available Resources to Revitalize the Tourism Economy of the Rural Commune of Iarintsena

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Abstract

This article is the product of in-depth research and strategies to mobilize and empower local stakeholders and tries to suggest some approaches, as well. Two methodologies are taken into account: The positive normative and SWOT analysis (Strength, Weakness, Opportunity and Threat). The latter enables us to present and identify the tourism development potential and issues. In 2021, Madagascar generated around 111.00 million US dollars, corresponds to 0.73 percent of its GDP in the tourism sector alone. Driven by favorable base effects, growth expected to accelerate to an average of 4.6% over 2024-26. Nowadays, tourism can offer high opportunities for cultural exchange between visitors and local communities. The research results from the project simulation works were used to draw up a budget for tourism activities. The rural commune of IARINTSENA, located in the south-eastern part of the Haute Matsiatra region and a few kilometers from the Ambalavao district, has tourism assets that appear to be weakened by innumerable constraints. The design of the commune's development strategies should take into account the realities and aspirations of the local population. Highlighting the commune's specific tourist attractions should encourage technical and financial partners to invest in the tourism development project. It's important to put the touristic specificity of IARINTSENA in evidence in order to incite the technical and financial partners.

Keywords

Culture, Iarintsena, Marketing, Potentiality, Strategy, Touristic Product

1. Introduction

At a time when Madagascar is working on the implementation of the Millennium Development Goals (MDGs), the ecotourism sector is one of the priorities for the development of the Regions and Communes. In fact, like all the countries bordering the Indian Ocean (Mauritius, Reunion, Seychelles....) [1-3], our country has strong ecotourism potential in terms of socio-cultural heritage and biodiversity. Consequently, the rational exploitation of these resources could be

the best solution for lifting Madagascar out of poverty and building sustainable development [4]. Ecotourism and rural tourism are among the solutions deemed relevant for promoting sustainable development in our country. Madagascar is a very favorable country for developing all the different forms of tourism: responsible tourism, solidarity tourism, ecotourism [5]. "The island is so diverse, you can do all types of tourism without one getting in the way of the other" [6].

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Received: 22 May 2024; **Accepted:** 7 June 2024; **Published:** 29 July 2024



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2. Approach and Motivations

The Commune rurale Of IARINTSENA in Ambalavao district was chosen as the setting project of this research. It is crossed by the national road n^o7 from Vatoavo pass to the rural Commune of Ankaramena (cf. Appendix II). Geographically, the said commune is bounded to the north by the urban Commune of Ambalavao, to the south by the rural Commune of Besoa, to the west by the rural Commune of Miarinarivo, and finally to the east by that of Manamisoa [4-7].

The existence of the following tourist destinations in the commune motivated us in our choice of working site

- 1) the Commune's chief town: which is prized for its culture, rural tourism and agrotourism [8].
- 2) the Fokontany of ANJA: favoured for its relaxation and sometimes culture, and ecotourism.
- 3) the Fokontany of Firaisantsoa: known for the existence of the Three Brothers Mountains, is an ideal place for relaxation, rural tourism and culture.
- 4) the Fokontany of Fivagnona: a reserve for sports tourism.

Comprising fourteen (14) Fokontany, the Commune boasts geographical and socio-cultural assets thanks to the existence of tourist sites, historic mountains and cultural riches. Its location and geographical potential make it a favorite or ideal competitor in the "Best Commune in Madagascar" competition. [9]

Two tourism associations already exist in the commune of FIOMBONANTSOA, based in the commune's main town, and ANJA MIRAY in ANJA. They offer a wide range of services to welcome foreign tourists. However, the population of this commune participates in the development of rural tourism, as well. Reception facilities have already been set up in IARINTSENA with the help of some financial partnerships.

On the other hand, in FIRAISANTSOA, the Commune's chief town, the population is still struggling with problems of insufficient income, while the inhabitants living in the vicinity of the ANJA tourist reserve suffer from a lack of infrastructure.

Thus, the central problem of the research lies in clarifying and mitigating the contradictory aspect between the strong potential for ecotourism development and the imbalance or poor distribution of income, which is reflected in the absence of a communal tourism policy and/or a coherent framework of orientation between the sector's stakeholders.

In view of this, the present study is based on the following three (03) research questions, namely:

- 1) what are the strategic issues and specific characteristics

of tourism in the Commune?

- 2) what are the main factors blocking the development of tourism in this locality; and,
- 3) how to reconcile the logic and objectives of the various stakeholders in setting up a concerted platform for steering, coordinating and implementing tourism development strategies in IARINTSENA?

3. Overall and Specific Objectives

The overall aim of this research project is to propose pragmatic strategies for mobilizing and empowering stakeholders in the development of sustainable tourism.

In this way, the project's sequencing is tracked by major type of impact and specific objective targeted. A system will be put in place to gather data regularly and using a variety of methods. As for the specific objectives, the main indicators selected are as follows: [10]

- 1) Characterize the commune's tourism potential,
- 2) Promote positive measures or solutions to the problem of tourism development, and
- 3) Internalize the logics of stakeholders with a view to promoting sustainable tourism in the locality.

To carry out this study, it is necessary to pose the following three (03) hypotheses:

- 1) Can the locality's natural and cultural resources meet the requirements and standards of the ecotourism and rural tourism sector?
- 2) Is the lack of professionalism the main obstacle to the development of tourism in this locality?
- 3) Is the integration of local actors in the development of solidarity tourism one of the appropriate solutions for the development of tourism in IARINTSENA? [7]

The expected results of this study are as follows:

- 1) the tourism potential of the Fokontany will be considered and harnessed,
- 2) indications concerning the problems of rural tourism development will be determined, and
- 3) strategies for developing the sector, adapted to the Commune's socio-cultural context will be proposed.

The study comprises three (03) main parts. The first part presents the methodology, including the bibliographic and webliography study, the development of field data collection media and the methods for processing the data collected. The second part will highlight the results obtained, together with the analysis and interpretation of the qualitative and quantitative information. And the last part will focus on discussions and appropriate recommendations for the sustainable development of Tourism in IARINTSENA [11].

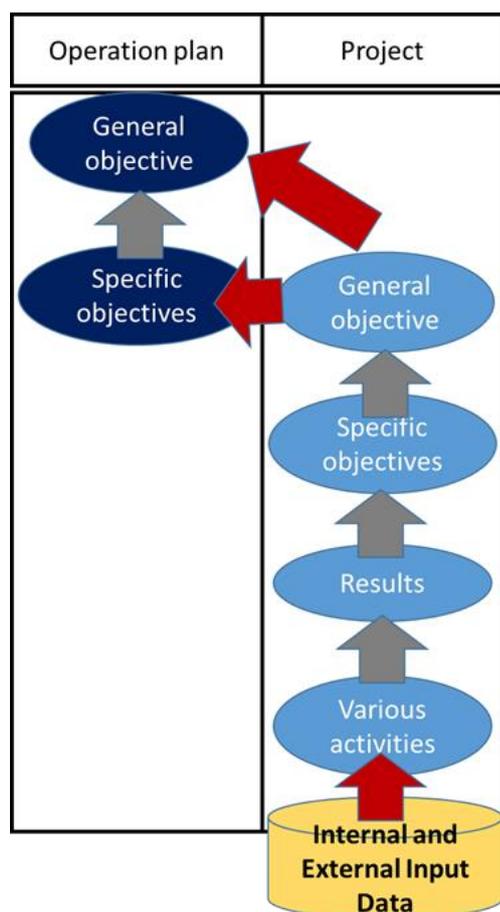


Figure 1. Relationship between operating plan and project.

4. Research Methodology

Almost the data collected is both quantitative and qualitative, drawn from a variety of sources and processed as required throughout the research. In fact, they relate to the treatment of stakeholders such as tourism actors, obtained from various responsible concerned people.

To carry out this work, a combination of two approaches was opted: "The normative" and "The positive" approaches.

The normative approach is subjective and values-based, originating in personal perspectives or opinions involved in the decision-making process. This first point consists of a qualitative analysis of the Commune's socio-cultural life, highlighting the community's civic and civic responsibility. Generally speaking, this type of model focuses on value judgments aimed at improving economic development, investment projects and wealth distribution [12, 13].

As for the positive approach which is the second point, focuses on describing, quantifying and explaining economic developments, expectations and associated phenomena. It applies an objective analysis of data, relevant facts and associated figures. It focuses on the quantitative and economic analysis of farming practices to solve rural socio-economic development problems, in this case those of IARINTSENA [14].

The application of this combined approach will make it easy to identify the potential of the tourism sector, to identify the problems of tourism development and to propose appropriate strategies for achieving the objectives of sustainable tourism development. To carry out this work, the methodology essentially comprises three (03) phases: the preparatory phase, the data collection phase and the data analysis phase.

5. Data Processing and Analysis Method

In the current context of technological evolution (technology watch), and in order to propose an innovative solution, the data collected during the data collection will be digitally processed and analyzed using the SWOT method followed by the economic analysis method. These analyses were carried out in nine (09) main areas, taking into account the general principles of Madagascar Tourism Master Plan: the tourism product, cultural tourism, reception and basic infrastructures, marketing and distribution, tourism stakeholders, tourism seasons and environment, investment in tourism, and the institutional framework. With regard to economic analysis, study request to carry out preliminary research at Ambalavao District [15, 16] (Hotels, Restaurants) in order to identify all the variables required for the study of the market, supply, demand and competitors. These studies were then used to draw up a budget based on the number of customers, accommodation and catering prices, transport costs, guide fees, staff salaries and charges, operating costs and charges and other external services. The operation of the budget will be planned for a period of five (05) years. As processing tools, GIS, EXCEL, WORD and TSIM software were useful.

The financial evaluation tools used for investment selection are as follows:

- 1) Net Present Value (NPV),
- 2) Internal Rate of Return (IRR),
- 3) Return on Capital Employed (ROCE), and
- 4) Profitability Index (PI).

5.1. Net Present Value (NPV)

This parameter provides a direct indication of the profitability of a tourism project. The Net Present Value (NPV) is defined as the difference between the sum of the self-financing capacities discounted at a certain rate required for the profitability of the investment; and the sum of the capital invested. Its formula is:

$$NVP = \sum_{i=1}^n CFO_j (1 + i)^{-j} - I_0$$

Where: *i*: discount rate

*I*₀: capital invested

n: year

CFO: Cash Flow from Operations

Net present value can be positive, zero or negative. It is interpreted as follows:

- 1) If NPV >0, the investment is more profitable than the required rate, and the project is highly acceptable because it is very profitable,
- 2) If NPV =0, the investment is profitable at the required rate. It gives the investment's break-even point, below which the project is rejected,
- 3) If NPV <0, the investment is less profitable than the required rate, so the project must be rejected.

NPV is therefore a selection tool for any project proposal. Among several projects, the one with the highest NPV will be selected.

5.2. Internal Rate of Return (IRR)

The Internal Rate of Return is the discount rate that gives a Net Present Value of zero. This rate can be calculated using a simple mathematical equation. An approximate approach is taken using the interpolation method, which is frequently used to determine the i-rate.

Like the rate of return, the rate after which the NPV is will be presented as follows:

$$NPV = 0 \text{ with } \sum_{i=1}^n CFO_j (1 + i)^{-j} - I_0 = 0$$

Therefore,

$$\sum_{i=1}^n CFO_j (1 + i)^{-j} = I_0$$

This rate is the maximum rate at which it is possible to borrow the capital needed to finance the investment, so that the planned operation will not be loss-making. To determine the project's profitability, the rate is compared with the required rate t . There are three (03) possible cases:

- 1) If IRR > t : the project investment is profitable, i.e. borrowing to support the project is possible,
- 2) If IRR = t : the return generated by the project is zero, i.e. any investment that will generate a profit must cross this threshold,
- 3) If IRR < t : no return, i.e. the project must be rejected.

To be able to decide on smooth projects, the best choice should always be the one with the highest Internal Rate of Return.

5.3. Capital Payback Period (CPP)

The payback period is the number of years required to reconstitute the capital invested. It corresponds to the time after which the net cash flows generated by the investment or operation repay the capital invested.

The interpolation method is the most frequently used to determine the payback period. Among several competing projects, the least risky is the one with the shortest payback period. The shorter the payback period, the more profitable the project.

5.4. Profitability Index (PI)

This index is calculated as the ratio between the sum of discounted cash flow and capital invested, and corresponds to the income generated by one Ariary of capital invested, i.e. the profit margin obtained by investing one Ariary. The formula is:

$$PI = \frac{\sum_{j=1}^n CFO_j (1+i)^{-j}}{I_0}$$

The profit rate " t " or the value of the profit margin is equal to the difference between the value of the profitability index and the unit value (1), such that:

$$t = PI - 1$$

Profitability is thus determined by comparing the profitability index and the monetary unit.

If $PI > 1$, profitability is higher than the required rate t .

If $PI = 1$, profitability is equal to the required rate t .

If $PI < 1$, profitability is lower than required rate t .

6. Different Profitability Ratios Taken into Account

The different profitability ratios taken into account used for our study are as follows:

- 1) Return On Funds (ROF)
- 2) Return On Investment (ROI)
- 3) Return On Sales (ROS)

6.1. Return on Funds (ROF) Ratio

This ratio represents the return on funds borrowed by co-operatives; it is obtained using the formula below:

$$ROF = \frac{\text{Net income}}{\text{Equity}}$$

If $ROF > 0$, profitability is higher than the required rate t , investment financing is assured thanks to the increase in profit, so the funds allocated to equity are profitable,

If $ROF = 0$, profitability is equal to the required rate t , profit is nil, so the project is not profitable,

If $ROF < 0$, profitability is lower than the required rate t .

The profit is unable to finance the equity, since the profit for the year is negative.

6.2. Return on Investment (ROI) Ratio

This ratio determines the profitability of fixed capital, i.e. the means of producing goods and services. The formula is as follows

$$ROI = \frac{Net\ Profit}{Capital\ Employed}$$

If $ROI > 0$, profitability is higher than the required rate t , and the profit generated by the project will ensure the renewal of the fixed assets acquired,

If $ROI = 0$, profitability is equal to the required rate t , and the use of fixed assets does not generate any profit for the year,

If $ROI < 0$, profitability is lower than the required rate t , the profit generated by the use of fixed assets is negative or in deficit, so the use of fixed assets is risky.

6.3. Return on Sales (ROS) Ratio

This ratio is an indicator of profit margin; it is calculated as follows:

$$ROS = \frac{Net\ Profit}{Sales\ Excluding\ Tax}$$

If $ROS > 0$, profitability is higher than the required rate t , the ratio of profit to sales for the year is highly profitable,

If $ROS = 0$, profitability is equal to the required rate t ,

profit for the year is zero compared with sales, and profitability is high,

If $ROS < 0$, profitability is lower than the required rate t , the rate of return is negative, so the year has suffered a loss, so the sales result is in deficit.

For these three (3) ratios, the higher their value, the more significant the result and the more beneficial the tourism development project.

7. Materials and Methods

The Materials and Methods section should provide comprehensive details to enable other researchers to replicate the study and further expand upon the published results. If you have multiple methods, consider using subsections with appropriate headings to enhance clarity and organization [15].

8. Results

Taking the results of the study, the above elements lead us to some results concerning the simulation at the end of the study.

Table 1. Summary of Sales, Year N.

SECTOR	AMOUNT (Ar)/PERIOD		TOTAL
	High season	Low season	
Transport	14 400 000	9 600 000	24 000 000
Accommodation	81 000 000	43 200 000	124 200 000
Catering	100 450 000	60 130 000	160 580 000
Guiding	7 200 000	7 200 000	14 400 000
TOTAL	203 050 000	120 130 000	323 180 000

These data highlight seasonal fluctuations in tourism spending, with higher spending during the high season, which may be linked to an increase in the number of visitors and greater demand for tourism services. This economic analysis

of tourism spending can help formulate strategies to optimize the use of available resources and stimulate the tourism economy of the commune of Iarintsena.

Table 2. Distribution of profits allocated to the promotion of local tourist activities.

Year	Net profit	15% of profits	Breakdown by type of tourism activity			
			Cultural (30%)	Sport (10%)	Agrotourism (30%)	Ecotourism (30%)
N	70 345	10 551	3 165	1 055	3 165	3 165
N+1	102 498	15 374	4 612	1 537	4 612	4 612

Year	Net profit	15% of profits	Breakdown by type of tourism activity			
			Cultural (30%)	Sport (10%)	Agrotourism (30%)	Ecotourism (30%)
N+2	131 576	19 736	5 920	1 973	6 920	5 920
N+3	174 690	26 203	7 861	2 620	7 861	7 861
N+4	214 409	32 161	9 648	3 216	9 648	9 648
Total	693518	104 027	31 208	10 402	31 208	31 208

The data in [table 2](#) show a substantial financial investment in the promotion of local tourism activities. Net profits are specifically allocated for this purpose, demonstrating the priority given to tourism development in the commune of Iarintsena.

Table 3. Production forecast (theoretical capacity).

Sector	High season	Low season	Total N	Total N+1	Total N+2	Total N+3	Total N+4
Transport	36	24	60	60	66	66	73
Accommodation	5 400	2 880	8 280	8 280	9 108	9 108	10 019
Catering	5 414	2 894	8 308	8 308	9 138.8	9 138.8	10 053
Guiding	360	360	720	720	792	792	871
Total	11 210	6 158	17 368	17 368	19 105	19 105	21 015

The table shows production forecasts, expressed in theoretical capacity, for the transport, accommodation, catering and guiding sectors, over the next five years for both high and low seasons. For each sector and season, theoretical production capacity is given in numbers, reflecting estimates of potential demand. These forecasts show an upward trend over

the years, indicating anticipated growth in the tourism sectors. This gradual increase suggests a potential for tourism development in the commune of Iarintsena, with increased capacity to meet growing visitor demand, which could help boost the local economy.

Table 4. Production forecast (theoretical capacity).

SECTOR	AMOUNT (Ar)/PERIOD		TOTAL
	High season	Low season	
Transport	14 400	9 600	24 000
Accommodation	81 000	43 200	124 200
Catering	100 405	60 130	160 580
Guiding	7 200	7 200	14 400
TOTAL	203 050	120 130	323 180

Table 5. Production forecast (theoretical capacity).

Sector	Total N	Total N+1	Total N+2	Total N+3	Total N+4
Transport	24 000	26 400	29 040	31 944	35 138
Accommodation	124 200	136 620	150 282	165 310	181 841
Catering	160 580	176 638	194 301	213 732	235 105
Guiding	14 400	15 840	17 424	19 166	21 083
Total	323 180	355 498	391 047	430 153	473 167

The table offers an economic and tourism perspective by presenting five-year sales forecasts for the main tourism sectors, such as transport, accommodation, catering and guiding, for the high and low seasons. The figures reflect a gradual growth in sales from year to year, indicating a potential for economic development in the commune of Iarintsena. This anticipated growth reflects an increase in tourism de-

mand and associated economic activity, which could stimulate investment in local tourism infrastructure and create employment opportunities. In addition, it also suggests an expected increase in visitor numbers, which could boost the local economy and reinforce the commune's appeal as a tourist destination.

Table 6. Summary of resources and use.

Employment (Uses)	Amount	Resources	Amount
Gross stable assets		Gross stable resources	
Fixed assets	221 655 000	Cash flow	51 453 860
Short-term employment		Long-term borrowing	200 265 000
Availability (bank)	30 063 860		
TOTAL	251 718 860	TOTAL	251 718 860

Table 6 provides an economic view of the resources and uses of the commune of Iarintsena. On the assets side, investments in fixed assets represent long-term commitments to infrastructure development, totaling 221,655,000 Ariary. In terms of resources, self-financing from previous profits amounts to 51,453,860 Ariary, while a long- and medium-term loan of 200,265,000 Ariary is contracted to finance further development projects. This economic approach highlights the prudent management of resources and the strategic use of debt to stimulate the commune's long-term economic and tourism growth.

9. Discussion

According to this study, promoting tourism in IARINTSENA requires the setting up of appropriate structures (Fokontany-level operational initiative committee, communal and regional platform), with stakeholders as the precursors of development. It is their duty to give concrete

form to each of the citizens' responsibilities with regard to their respective operationalization. In addition, the study showed that the approach adopted was designed to enhance the local cultural identity and tourism products of the site studied. This approach should convince intellectuals that it is possible to set up positive development projects while preserving cultural identity [16].

Despite this, it's high time for the local population as a whole to gradually abandon the logic of traditional, wait-and-see attitudes to opportunities and move towards the logic of design, action and openness in terms of tourism development activities on the one hand, and regional managers and players must not neglect the aspirations of farmers, the strategies adopted, good governance and, the model at the level of transparency, participatory democracy through the establishment of committees and platforms, on the other. The basis for development must come from individual initiative, groups, associations and limited liability company (LLC), regions and the State (bottom-up logic) [17, 18].

Will local development players manage to maintain tourism

operations without neglecting the risks associated with raw material shortages (natural resources), population growth and unsuccessful changes in the behavior of rural people? Will the insecurity and domination of foreign culture lead to negative changes in rural behavior?

10. Conclusions

The results obtained show that the two (02) hypotheses set out above have been verified. Indeed, IARINTSENA has invaluable natural resources [19], as described in the introduction and in the related SWOT analysis results. The same applies to the lack of professionalism, which has also been verified. As for the third hypothesis, it is partially verified, as it depends on the logics of the actors' capacity and skills in tourism development.

Abbreviations

LLC	Limited Liability Company
SWOT	Strength, Weakness, Opportunity and Threat
MDGs	Millennium Development Goals
NPV	Net Present Value
IRR	Internal Rate of Return
ROCE	Return on Capital Employed
PI	Profitability Index
NPV	Net Present Value
CFO	Cash Flow from Operations
IRR	Internal Rate of Return
CPP	Capital Payback Period
ROF	Return on Funds
ROS	Return on Sales

Author Contributions

Randrianasolo Herilalaina Fabien: Conceptualization, Resources, Methodology

Andriamiadanomenjanahary Harivelo Chandellina Camille: Supervision, Data curation, Formal Analysis, Writing – review & editing, Writing – original draft

Funding

This work is not supported by any external funding.

Data Availability Statement

The data supporting the outcome of this research work has been reported in this manuscript.

Conflicts of Interest

The authors declare no conflicts of interest.

References

- [1] ANDREAS Irène, 1989, "evaluation of tourist sites", p. 342.
- [2] DECOUVERT GUIDE REUNION ISLAND, 2008-2009, "Reunion, one island, one world", p. 39.
- [3] KOTLER & DIBOIS, 2003 «marketing management» new horizons, Edition 11, Paris p650.
- [4] THE QUARTERLY PUBLICATION OF THE MADAGASCAR TOURISM OPERATORS GROUP «GO TO MADAGASCAR», 2006, «RN7, the southern road to go» magazine n°13, p 44.
- [5] THE QUARTERLY PUBLICATION OF THE MADAGASCAR TOURISM OPERATORS GROUP «GO TO MADAGASCAR», 2008, "trip to the country of Vezo» magazine n°18, p 15.
- [6] THE QUARTERLY PUBLICATION OF THE MADAGASCAR TOURISM OPERATORS GROUP «GO TO MADAGASCAR», 2008, "Our Malagasy destination series: Island Dust around Nosy BeNosy Be» n°19, p 56.
- [7] THE QUARTERLY PUBLICATION OF THE MADAGASCAR TOURISM OPERATORS GROUP «GO TO MADAGASCAR», 2008, "Our Malagasy destination series: Vanilla scents of the Green Triangle" magazine n°20, p 48.
- [8] Maïté GONZALEZ; May 2002, Local Agenda 21 "think globally and act locally", p. 5.
- [9] MINISTRY OF SECONDARY EDUCATION AND BASIC EDUCATION, 2001 "ny Voaary: environmental education" édition CNAPMAD, p. 112.
- [10] MINISTRY OF THE ENVIRONMENT, FORESTRY AND TOURISM, 2008, «Official tourism directory of Madagascar» 2nd edition bilingual French/Malagasy, p 314.
- [11] MINISTRY OF TOURISM, 1995, "Policy and Strategy for the Development of Tourism in Madagascar".
- [12] MINISTRY OF TOURISM, GENERAL SECRETARIAT, Standardization and Monitoring Department, October 1996, Law No. 95-017 on the tourism code, p. 7".
- [13] MONOGRAPHY of the rural commune of IARINTSENA. P. 66.
- [14] NORBLIN MARIE Pierre, 1994-1995, «Perspective of tourism development in Madagascar», DEA end-of-study dissertation, University of Law and Sciences, Marseille 3, p. 260.
- [15] FIANARANTSOA REGIONAL TOURISM OFFICE, 2008, "the Multicolore, Carambole edition, p. 8.
- [16] ONTM: MADAGASCAR TOURISM INFO, May 2008, «Recreation area and adventure land», FCB Synergy edition édition, p. 28.
- [17] UNITED NATIONS ENVIRONMENT PROGRAM (UNEP), 2004, 1 the future of the environment in Africa, Case studies, UNEP, p. 187.

- [18] RAHARINELINA Miangalisoa Jeanne (1995); "Contribution to the promotion of ecotourism in the Manjakatempo forest and fish station", end of study dissertation ESSA water and forestry department; p 77.
- [19] RAZAFIMBAHINY Christian Alphonse, 1990 «Madagascar Marketing Handbook», Cecor editions; p130.

Biography



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Research Field

Randrianasolo Herilalaina Fabien: management, sociology, agronomy, financial administration, economics, tourism, engineering, territorial planning, legal science, diplomacy

Andriamiadanomenjanahary Harivelo Chandellina Camille: Artificial Intelligence, Data and Big Data analysis, Economic, Mathematic, Management, Operational Research (optimization), Telecommunication