Université de Liège

Valuing Attractive Landscapes in the Urban Economy

Work Package 4, Action 4.2: Report on the estimation of non-market values from different scenarios in Verviers - Cycling and walking path along the river Vesdre

Final report - March 2012

Territorial development

Christelle Viaud-Mouclier
Research Associate

with the collaboration of
Pierre Christopanos
GIS officer

under the guidance of
Jean-Marie Halleux
Scientific Collaborator

Guénaël Devillet
Director of SEGEFA

VALUE

SEGEFA

VALUE

VALUING ATTRACTIVE LANDSCAPES IN THE URBAN ECONOMY

WORK PACKAGE 4, ACTION 4.2

REPORT ON THE ESTIMATION OF NON-MARKET VALUES FROM DIFFERENT SCENARIOS IN VERVIERS

- CYCLING AND WALKING PATH ALONG THE RIVER VESDRE -

« FINAL REPORT »

SEGEFA – ULg

Sart-Tilman B11 - Allée du 6 août, 2 – 4000 LIEGE

Christelle.Viaud-Mouclier@ulg.ac.be

jean-marie.halleux@ulg.ac.be

March 2012

People who have participated in the study:

SEGEFA-ULg
Sart-Tilman B11
2, Allée du 6 Août
4000 Liège
Phone : 0032 4 3665264
Email : Christelle.Viaud-Mouclier@ulg.ac.be
jean-marie.halleux@ulg.ac.be

Christelle Viaud-Mouclier (Research Associate) with the collaboration of Pierre Christopanos (GIS Officer), under the guidance of Jean-Marie Halleux (Scientific Collaborator).

Acknowledgement:

We would sincerely like to thank all the people at the City of Verviers and the Economic Development Agency for the Province of Liege who have contributed to the reports and have been extremely helpful by giving their time and information.

Our special thanks go to Ms. Florence Rittweger, Mr. Gregory Mercier and Mr. Bruno Poskin from the City Council of Verviers, Ms. Julie Moreau from the Economic Development Agency for the Province of Liege and finally to all the members of the Support Committee.

TABLE OF CONTENTS

INTRODUCTION **9**

1 DEFINITION OF THE PROJECT **13**

1.1 OVERVIEW OF THE CASE STUDY AREA 13
1.1.1 Verviers as an industrial and commercial centre *13*
1.1.2 River Vesdre as a structured element of the city *14*
1.2 SOCIO-DEMOGRAPHIC PROFILE OF THE POPULATION LIVING IN THE AREA 15
1.2.1 Population *16*
1.2.2 Gender *17*
1.2.3 Age *18*
1.2.4 Employment and unemployment *19*
1.2.5 Household composition *19*
1.2.6 House ownership *20*
1.2.7 Car and bicycle ownership *20*
1.2.8 Average income per person *21*
1.2.9 Intermediate conclusion *21*
1.3 DESCRIPTION AND LOCATION OF THE GREEN INFRASTRUCTURE PROJECT 22
1.3.1 Definition of green infrastructure *22*
1.3.2 Description of the green infrastructure project *22*
1.3.3 Description of the costs *24*

2 BOTTOM-UP APPROACH: ECONOMIC VALUATION **25**

2.1 METHODOLOGY 25
2.1.1 General overview *25*
2.1.2 Contingent valuation method *27*
2.1.3 Choice Modelling Method *34*
2.1.4 Organisation of the survey *38*
2.1.5 Visual aids *43*
2.2 RESULTS AND DISCUSSION 44
2.2.1 Results of the survey conducted in the study area *44*
2.2.2 Results of the second survey and comparison with the first survey *79*
2.2.3 Discussion *95*

3 TOP-DOWN APPROACH: MULTIPLIER ANALYSIS **101**

3.1 METHODOLOGY 101
3.1.1 Allocate all costs and benefits from CBA to specific economic sectors *101*
3.1.2 Draw up the input-output table at regional level and calculate the total impact *108*
3.1.3 Estimate the output multiplier for the given sectors at regional level (on the basis of the input-output analysis) *109*
3.2 RESULTS AND DISCUSSION 110
3.2.1 Results *110*
3.2.2 Discussion *113*

4 CONCLUSION **114**

5 APPENDICES **116**

5.1 CITY CENTRE MASTERPLAN 116

5.2 INTRODUCTION LETTER 117
5.2.1 Original version 117
5.2.2 Translated version 118
5.3 QUESTIONNAIRE 119
5.3.1 Original version 119
5.3.2 Translated version 131
5.4 VISUAL AIDS USED DURING THE FACE-TO-FACE INTERVIEW 143

6 BIBLIOGRAPHY 148

TABLE OF FIGURES

FIGURE 1: WP4 – ECONOMIC VALUATION OF GREEN INFRASTRUCTURE NETWORKS 10
FIGURE 2: THE DIFFERENT SITES ALONG THE RIVER VESDRE IN VERVIERS 11
FIGURE 3: GEOGRAPHICAL POSITION OF VERVIERS AND THE CASE STUDY AREA AT A SMALL SCALE 14
FIGURE 4: LOCATION OF THE STUDY AREA AT A BIGGER SCALE 15
FIGURE 5: MASTERPLAN OF THE CYCLE AND PEDESTRIAN PATH ALONGSIDE THE RIVER VESDRE 23
FIGURE 6: ECONOMIC VALUE OF GREEN INFRASTRUCTURES 28
FIGURE 7: SITUATION OF REFERENCE: NATURAL PLANT COVER 30
FIGURE 8: SITUATION OF REFERENCE: NATURAL PLANT COVER 36
FIGURE 9: BARREN PATH SCENARIO 36
FIGURE 10: STRUCTURED PLANT COVER 37
FIGURE 11: RANDOM SELECTION OF 10% OF THE PLOT LOCATED IN THE STUDY AREA 41
FIGURE 12: Q31: NUMBER OF RESPONDENTS PER EMPLOYMENT STATUS CATEGORY 46
FIGURE 13: Q34: HOW MANY CHILDREN UNDER 15 YEARS OLD ARE THERE IN YOUR HOUSEHOLD? 47
FIGURE 14: Q35: PERCENTAGE OF RESPONDENTS PER EDUCATION LEVEL 47
FIGURE 15: Q37: PERCENTAGE OF RESPONDENTS PER INCOME LEVEL 49
FIGURE 16: Q19: HOW USEFUL WERE THE VISUAL AIDS TO YOUR UNDERSTANDING OF THE DIFFERENT OPTIONS? 50
FIGURE 17: FOR WHICH REASONS DO YOU NOT GO THERE? 51
FIGURE 18: HOW OFTEN DO YOU USE THE "RÉCOLLETS" PATH? 52
FIG. 18.1: WHOLE SAMPLE 52
FIG. 18.2: RESPONDENTS GOING TO THE "RÉCOLLETS" PATH 52
FIGURE 19: THE LAST TIME YOU USED THE "RÉCOLLETS" PATH, WHAT WAS THE MAIN ACTIVITY YOU CARRIED OUT? 53
FIGURE 20: IN YOUR OPINION, ARE THERE CLEANLINESS OR SAFETY PROBLEMS ON THE "RÉCOLLETS" PATH? 54
FIGURE 21: IN YOUR OPINION, SHOULD ADDITIONAL MEANS/RESOURCES BE DEVOTED TO ENSURE THE CLEANLINESS OF THE "RÉCOLLETS" PATH? 55
FIGURE 22: IN YOUR OPINION, SHOULD ADDITIONAL MEANS/RESOURCES BE DEVOTED TO ENSURE THE SAFETY OF THE "RÉCOLLETS" PATH? 55
FIGURE 23: ADDITIONAL RESOURCES RELATED TO THE SAFETY OF THE PATH 56
FIGURE 24: DISTRIBUTION OF THE RESPONDENTS BETWEEN THE DIFFERENT WTP VALUES 60
FIGURE 25: WTP ACCORDING TO RESPONDENT'S AGE 61
FIGURE 26: WTP ACCORDING TO RESPONDENT'S DOMESTIC INCOME PER MONTH 61
FIGURE 27: WTP ACCORDING TO THE USE OF THE "RÉCOLLETS" PATH 62
FIGURE 28: WTP FOR THE NATURAL PLANT COVER ACCORDING TO THE FINAL CHOICE MADE BY THE RESPONDENTS. 66
FIGURE 29: NATURAL PLANT COVER 67
FIGURE 30: BARREN PATH 67
FIGURE 31: STRUCTURED VEGETATION 67
FIGURE 32: NUMBER OF RESPONDENTS CHOOSING EACH GREEN INFRASTRUCTURE SCENARIO 68
FIGURE 33: ORIGINAL QUOTATIONS FOR STRUCTURED VEGETATION SCENARIO 69
FIGURE 33BIS: TRANSLATED QUOTATIONS FOR STRUCTURED VEGETATION SCENARIO 69
FIGURE 34: ORIGINAL QUOTATIONS FOR BARREN PATH SCENARIO 70
FIGURE 34BIS: TRANSLATED QUOTATIONS FOR BARREN PATH SCENARIO 70
FIGURE 35: ORIGINAL QUOTATIONS FOR NATURAL PLANT COVER 71
FIGURE 35BIS: TRANSLATED QUOTATIONS FOR NATURAL PLANT COVER 71
FIGURE 36: Q12: IF THIS LANDSCAPING PROJECT WAS CARRIED OUT, WOULD IT ENCOURAGE YOU TO VISIT THE SITE? 72
FIGURE 37: Q20: IF THE BICYCLE AND PEDESTRIAN PATH AT THE BANK OF THE RIVER VESDRE WAS CREATED, WOULD YOU GO ALONG THE RIVER VESDRE MORE OFTEN, AS OFTEN OR LESS OFTEN? 72

FIGURE 38: IN AVERAGE, HOW MANY ADDITIONAL VISITS PER MONTH TO THE SITE (ALONG THE RIVER VESDRE) WOULD THIS CORRESPOND TO? 73
FIGURE 39: Q13: WHICH ACTIVITY WOULD YOU CARRY OUT THERE? 74
FIGURE 40: HOW OFTEN DO YOU VISIT THIS (THESE) PARK(S)? 75
FIG. 40.1: WHOLE SAMPLE 75
FIG. 40.2: RESPONDENTS GOING TO VERVIERS PARKS 75
FIGURE 41: FLOW OF VISITORS TO VERVIERS PARKS 76
FIGURE 42: HOW OFTEN DO YOU VISIT THIS (THESE) AREA(S)? 77
FIG. 42.1: WHOLE SAMPLE 77
FIG. 42.2: RESPONDENTS GOING TO RIVERS AND GREEN AREAS IN THE REGION AROUND VERVIERS 77
FIGURE 43: WHICH IS THE MAIN ACTIVITY YOU TAKE PART IN THESE GREEN AREAS? 78
FIGURE 44: FLOW OF VISITORS TO RIVERS AND GREEN AREAS IN THE REGION AROUND VERVIERS 78
FIGURE 45: WHICH SCENARIO DO YOU PREFER (YOU SHOULD TAKE INTO ACCOUNT THE YEARLY FINANCIAL CONTRIBUTIONS)? 99

TABLE OF TABLES

TABLE 1: DEVELOPMENT RATE OF THE POPULATION IN THE STUDY AREA FROM 2001 TO 2009 / 2010* 16
TABLE 2: PROPORTION OF FOREIGNERS IN THE STUDY AREA IN 2009 / 2010* 16
TABLE 3: ANNUAL DEVELOPMENT RATE OF THE FOREIGN POPULATION BETWEEN 2001 AND 2009 / 2010* 17
TABLE 4: GENDER REPARTITION IN 2009 / 2010* 17
TABLE 5: DEVELOPMENT RATE BETWEEN 2001-2009 / 2001-2010* 18
TABLE 6: DISTRIBUTION BY AGE AND DEVELOPMENT RATE BETWEEN 2001-2009 / 2001-2010* 18
TABLE 7: UNEMPLOYMENT RATE IN 2001 19
TABLE 8: HOUSEHOLD COMPOSITION IN 2009 19
TABLE 9: OWNERSHIP RATE IN 2001 20
TABLE 10: CAR AND BICYCLE OWNERSHIP PER HOUSEHOLD IN 2001 20
TABLE 11: AVERAGE INCOME PER PERSON IN 2002 AND 2008 21
TABLE 13: ELICITING VALUATIONS 31
TABLE 14: PEOPLE ACCEPTING TO PAY 25€ OF LOCAL TAX PER YEAR 32
TABLE 15: PEOPLE REFUSING TO PAY 25€ OF LOCAL TAX PER YEAR 33
TABLE 16: ANSWERS TO THE FOLLOW-UP QUESTIONS ASKING WHY THE RESPONDENT GIVES A ZERO WTP 33
TABLE 17: ATTRIBUTES AND LEVELS USED IN THE CHOICE MODELLING ANALYSIS 35
TABLE 18: CHOOSING THE SAMPLE SIZE 39
TABLE 19: NUMBER OF INTERVIEWS ACHIEVED BY STREET 41
TABLE 20: THE SURVEY AREA AND NUMBERS OF RESPONDENTS 42
TABLE 21: TYPES OF BIAS RECORDED AND SOLUTIONS IMPLEMENTED 43
TABLE 22: Q30: DEMOGRAPHIC INDICATOR - DISTRIBUTION BY GENDER 44
TABLE 23: Q29: DEMOGRAPHIC INDICATOR - DISTRIBUTION BY AGE 45
TABLE 24: ECONOMIC INDICATOR – LABOR MARKET INDICATOR OF THE STUDY AREA 45
TABLE 25: Q33: DEMOGRAPHIC INDICATOR - HOUSEHOLD COMPOSITION 46
TABLE 26: Q35 AND Q36: HOUSEHOLD AND ECONOMIC INDICATORS - OWNERSHIP RATE AND MOTORIZATION RATE 48
TABLE 27: Q37: SALARY LEVEL OF THE RESPONDENTS 48
TABLE 28: ANSWERS TO THE FOLLOW-UP QUESTIONS ASKING WHY THE RESPONDENT GIVES A ZERO WTP 57

TABLE 29: DISTRIBUTION OF THE RESPONDENTS BETWEEN THE DIFFERENT WTP VALUES FOR THE CONTINGENT VALUATION QUESTION – "NATURAL PLANT COVER" 59
TABLE 30: STATISTICAL ANALYSIS – CONTINGENT VALUATION QUESTION – "NATURAL PLANT COVER" 60
TABLE 31: DISTRIBUTION OF THE RESPONDENTS BETWEEN THE DIFFERENT WTP VALUES FOR CHOICE MODELLING SCENARIO – "BARREN PATH SCENARIO" 64
TABLE 32: STATISTICAL ANALYSIS – CHOICE MODELLING QUESTION – "BARREN PATH SCENARIO" AND "NATURAL PLANT COVER" 64
TABLE 33: DISTRIBUTION OF THE RESPONDENTS BETWEEN THE DIFFERENT WTP VALUES FOR CHOICE MODELLING SCENARIO – "STRUCTURED PLANT COVER" 65
TABLE 34: STATISTICAL ANALYSIS – CHOICE MODELLING QUESTION – "STRUCTURED PLANT COVER", "BARREN PATH SCENARIO" AND "NATURAL PLANT COVER" 65
TABLE 35: FLOW OF VISITORS TO VERVIERS PARKS 76
TABLE 36: FLOW OF VISITORS TO RIVERS AND GREEN AREAS IN THE REGION AROUND VERVIERS 79
TABLE 37: CHOOSING THE SAMPLE SIZE 80
SOCIO-ECONOMIC DATA 80
TABLE 38: SUMMARY TABLE OF THE SURVEY RESULTS 81
TABLE 39: SUMMARY TABLE OF THE "RÉCOLLETS" PATH DATA 83
TABLE 40: ANSWERS TO THE FOLLOW-UP QUESTION ASKING WHY THE RESPONDENT GIVES A ZERO WTP 84
TABLE 41: DISTRIBUTION OF THE RESPONDENTS BETWEEN THE DIFFERENT WTP VALUES FOR THE CONTINGENT VALUATION QUESTION – "NATURAL PLANT COVER" 85
TABLE 42: STATISTICAL ANALYSIS – CONTINGENT VALUATION QUESTION – "NATURAL PLANT COVER" 85
TABLE 43: DISTRIBUTION OF THE RESPONDENTS BETWEEN THE DIFFERENT WTP VALUES FOR THE CHOICE MODELLING QUESTION – "BARREN PATH SCENARIO" 86
TABLE 44: STATISTICAL ANALYSIS – CHOICE MODELLING QUESTION – "BARREN PATH SCENARIO" 86
TABLE 45: DISTRIBUTION OF THE RESPONDENTS BETWEEN THE DIFFERENT WTP VALUES FOR THE CHOICE MODELLING QUESTION – "STRUCTURED VEGETATION" 87
TABLE 46: STATISTICAL ANALYSIS – CHOICE MODELLING QUESTION – "STRUCTURED VEGETATION" 87
TABLE 47: PERCENTAGE OF RESPONDENTS CHOOSING EACH SCENARIO 88
TABLE 48: FLOW OF VISITORS TO VERVIERS PARKS 89
TABLE 49: FLOW OF VISITORS TO RIVERS AND GREEN AREAS IN THE REGION 91
TABLE 50: TIME SPACE FROM THE PROJECT SITE 92
TABLE 51: CORRELATION BETWEEN TIME SPACE AND WTP FOR THE FIRST SURVEY 93
TABLE 52: CORRELATION BETWEEN TIME SPACE AND WTP FOR THE SECOND SURVEY 94
TABLE 53: MATRIX REPRESENTATION OF BENEFITS OF DEVELOPMENT SCENARIOS 102
TABLE 54: MATRIX REPRESENTATION OF COSTS OF DEVELOPMENT SCENARIOS 103
TABLE 55: ESTIMATED INVESTMENT COSTS IN EUR AND % OF THE TOTAL COST 104
TABLE 56: DESCRIPTION OF THE SELECTED SECTORS 107
TABLE 57: STRUCTURE OF AN INPUT-OUTPUT TABLE 108
TABLE 58: MATRIX OF INVERSE COEFFICIENTS 110
TABLE 59: APPLICATION OF INPUT-OUTPUT ANALYSIS TO VERVIERS 111
TABLE 60: BUDGET BREAKDOWN OF THE VALUE PROJECT IN VERVIERS 112
TABLE 61: WEIGHTING COEFFICIENTS 112

INTRODUCTION

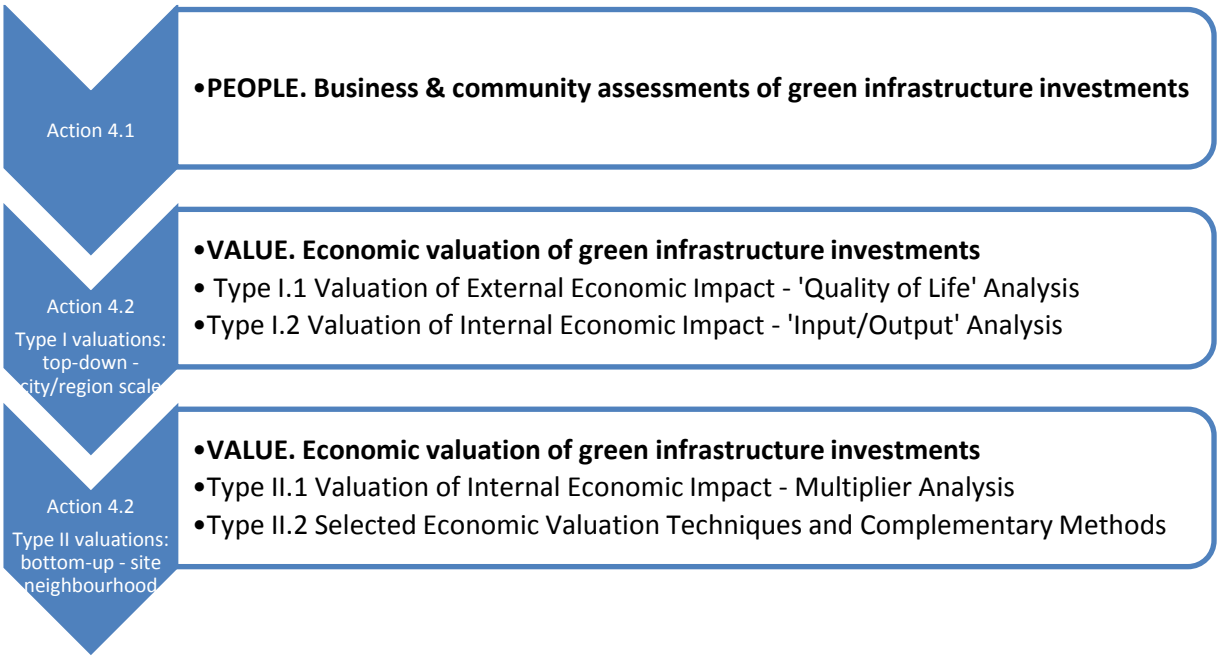
The present report provides a comprehensive overview of the work which has been done for the economic valuation of the planned cycling and walking path along the river Vesdre in the framework of the VALUE - Valuing Attractive Landscapes in the Urban Economy - project[1]. The VALUE project is divided into 5 work-packages and the present report deals more specifically with Action 4.2 of work-package 4. The aim of this work-package is to assess the competitive benefits of green infrastructure networks at two scales: site and city/region scale.

At the city/region scale (Action 4.2 Type I), the purpose is to address the overall impact of green infrastructure improvements. The evaluation framework consists of two parts: part 1 deals with the internal economic effects of green infrastructure investments, which will be valued through the construction of an input/output table (Action 4.2 Type I.1) in combination with multiplier analysis (Action 4.2 Type II.1) for the VALUE investments done in the City of Verviers. The external economic effects are targeted by the (partial) 'Quality of Life' analysis (Action 4.2 Type II.1) which uses existing secondary data from the Urban Audit and CORINE databases. The 'Quality of Life' analysis has been undertaken by the "Institut für Landes- und Stadtentwicklungsforschung". The tasks set previously described one part of the research conducted in the Action 4.2 ('economic valuation of green infrastructure investments – real time and ex-post evaluation').

At the site/neighbourhood scale (Action 4.2 Type II), the objective is to evaluate the impact of individual investment. A cost-benefit-analysis has been carried out using stated preference techniques and complementary methods. Two types of data collection have been designed to assess the economic valuation at the site scale: (1) business and resident focus groups, which refer to Action 4.1 ('qualitative business and community assessments of green infrastructure') and for which a report ('Report on Focus Group Interviews in Verviers – Cycling and walking path along the river Vesdre') has been written (Moreau et al., 2010); (2) face-to-face interviews conducted in Verviers allowing us to develop a cost-benefit-analysis which is the second part of the Action 4.2 (Sheffield City Council – South Yorkshire Forest Partnership, 2007). The structure of the research is set out in the map figure 1.

[1] The VALUE project - Valuing Attractive Landscapes in the Urban Economy – is funded under the INTERREG IVB North West Europe (NEW) programme. The project started in June 2008 and will end in May 2012 with the organisation of an international conference in Sheffield.

Figure 1: WP4 – Economic valuation of green infrastructure networks



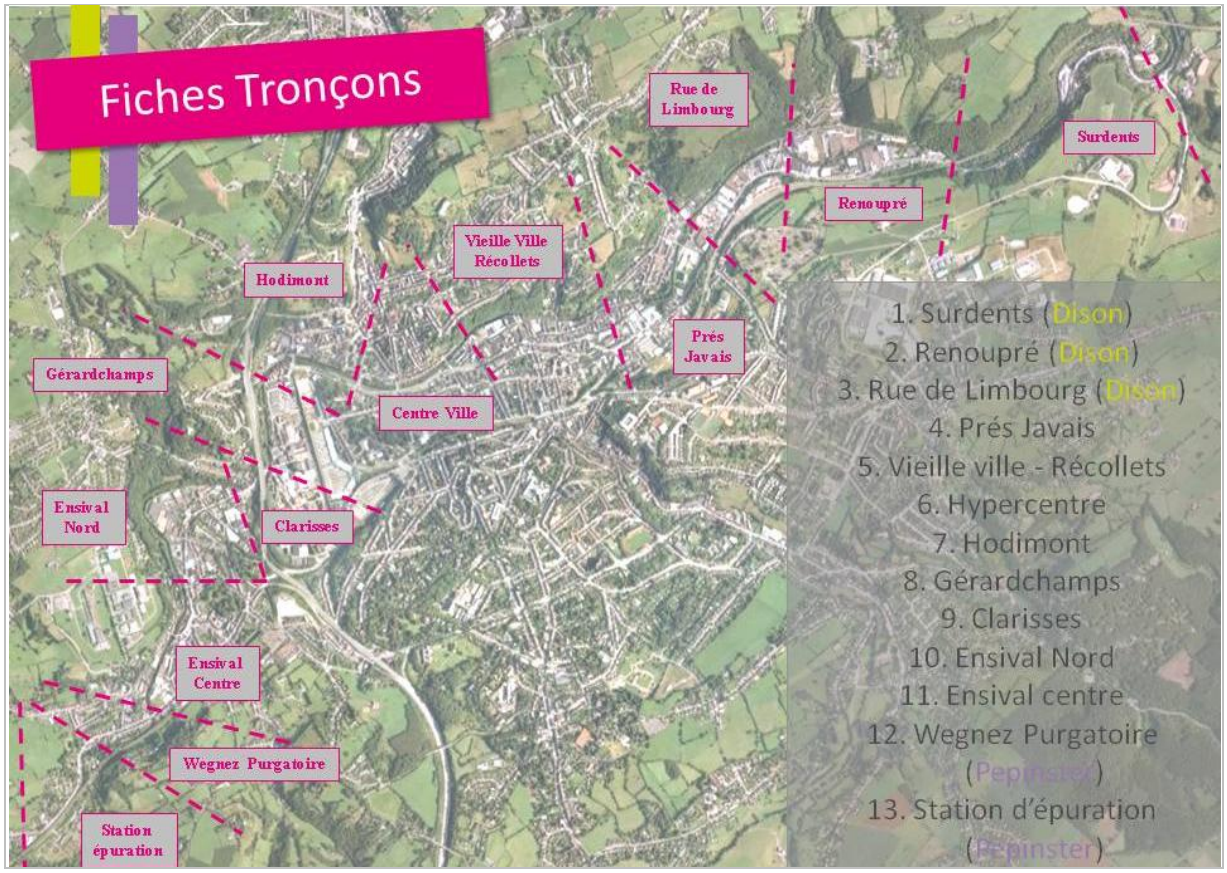
Source: SEGEFA-ULg, 2011. Adapted from Sheffield City Council – South Yorkshire Forest Partnership, 2007.

The overall aim of the study is to determine "the economic value of green investment at regional and city scale and to demonstrate how to target green investments in order to create the maximum competitive benefits to NWE communities" (Interreg IVB – NWE - Application Form, 2007). An implicit objective is to study under which conditions the enhancement and creation of green infrastructures are a sustainable investment. Indeed, "estimates of economic value are a common ingredient in public policy debates about appropriate strategies for managing natural resources" (Whittington et al., 1994, p.11). Therefore, in the present report we analyse in which way policy-makers can rely on Cost-Benefit Analysis (CBA) as economic decision-making approach on territorial development. As Pearce and Özdemiroglu (2002, p.22) added "money valuation is a key pillar of CBA. Economic values expressed in money terms, if properly determined will reflect people's preferences and can thus be used as weights to inform any policy analysis or decision process". In other words, the implementation of a CBA analysis allows the researchers to determine the costs and benefits related to the project. The costs and benefits are expressed in money terms.

The report 1.2 named "Baseline Analysis of Existing Economic Valuation Tools for Application to Green Infrastructure Investments" provides a comprehensive overview of the different economic valuation tools that we could use. On the basis of this report, we decided to design and implement a stated preference study. This method relies on asking respondents questions in order to determine the preferences for resource allocation. Stated preference technique is composed of two alternatives that we decided to combine: contingent valuation and choice modelling. In the report 1.2, it was agreed that we would conduct further interviews with local stakeholders and communities and would use computer-modified images. We should also develop a matrix representation of costs and benefits of development scenarios.

The planned cycling and walking path along the river Vesdre between the Grande Rame Street and the Epargne Bridge is one of the 13 sites which make up the path along the river Vesdre, which flows through the city of Verviers (see figure 2). This site is called “Prés-Javais”, which is the name of one of the statistical districts along the river Vesdre selected for the study. The Prés-Javais site has been chosen because it is located not far away from the Couvalles, which is a small business park. The Couvalles area in Verviers is an old textile industry site. The buildings on the site are currently dedicated to storing all vehicles, trucks, public works machines, equipment and machine accessories used by the Verviers City Council. Today, the site counts 10 enterprises. It represents between 19 and 36 jobs. The site will be demolished by Verviers City Council during the autumn semester 2012 through FEDER funds. It will be equipped by the Economic Development Agency for the Province of Liege in the framework of Plan Marshall 2.vert by the end of 2014. Verviers City Council expects up to 60 jobs in the near future because of the high-density site and the presence of different enterprise-types on the site.

Figure 2: The different sites along the river Vesdre in Verviers



Source: Technical Services, Department of City Planning, Verviers City Council, October 2010.

Moreover, this site has been chosen because of its central location (near the city centre). Verviers city council plans to develop in priority the sites located near the city centre. Finally, the four districts covered by the study area are showing a development of their social and economic indicators. It is a supplementary advantage for implementing the VALUE project in this area.

Before implementing the economic valuation, we conducted two focus group interviews in Verviers, one with businesses and one with residents. These focus groups had several objectives:

- To help us to confirm which method between revealed and stated preference techniques we would use. Revealed preference technique means the analysis of price development of market goods (e.g. house prices) influenced by non-market goods (e.g. noise). Stated preference technique implies creating markets, in which the respondents are asked to state what economic value they give to those goods and services. At the beginning, the intention was to implement a revealed preference study. However, the unavailability of the real estate data and the readiness of the residents from the focus group to get involved by filling the survey encouraged us to implement a stated preference study.
- To help us to define the target population: following the focus groups, we decided to implement the economic valuation by focusing on the residents. The businesses, whose work wasn't related to green space didn't seem to care about it. Furthermore, the Couvalles area is still a redevelopment area and the number of enterprises is not significant for the purposes of a survey.
- To help us to determine the attributes and levels of each attribute of the scenarios of the choice modelling approach.
- To help us to design the different elements of the hand-made drawings.

Moreover, we conducted further interviews with local stakeholders and communities in order to validate the data collected through the focus groups and to get more information concerning the payment vehicle, the attributes and levels of the different scenarios composing the choice modelling study, etc…

We conducted two series of interviews, one to obtain the input of the residents and one to obtain the vision of the "Verviétois" in general. The first series of interviews was conducted in the 150m buffer area around the VALUE project and consisted of in-home interviews. The second series of interviews was conducted in the "Place Verte" located in the city centre and consisted of on-street interviews. We analyse the results of the two surveys separately in order to be able to compare the results.

The structure of the report is as follow. Firstly, we define the project through historical elements and socio-demographic data at the scale of Verviers municipality and at the scale of the area in which it will be implemented. The green infrastructure project is more particularly described and localized. Secondly, we carry out an economic valuation through two stated preference techniques used under the framework of CBA. Before reporting and discussing the results of both surveys, we present the different economic valuation method used, the design of the questionnaire and visual aids. The objective of this part is to "evaluate the economic impact [of the Verviers's investment] in terms of green investment" (Verspecht, 2010, p.8). Another part of the report is dedicated to an input/output and multiplier analysis. This part of report aims to study the internal economic effects of the Verviers's green infrastructure investment.

1 DEFINITION OF THE PROJECT

1.1 Overview of the case study area[2]

1.1.1 Verviers as an industrial and commercial centre

The city of Verviers, which is located in the Province of Liege, at the south border of "Pays de Herve", was an important industrial and commercial centre. "In 1846, among the 18,153 workers occupied in the wool industry in Belgium, 16,615 worked in the Arrondissement of Verviers, and at the turn of the century, 24 out of 27 industries specialized in wool treatment in the Country were established in Verviers" (Bauwens, 1994, p.9). Therefore, we cannot omit mentioning the golden past of Verviers. The water of the river Vesdre, which flows through Verviers, gave Verviers the opportunity to developing a competitive wool industry. In the 18th and 19th century, the modern wool industry expanded on the banks of the Vesdre's waters, because of the investments of John Cockerill, who was a pioneer in the mechanization of the wool industry with the setting up of the first wool machine on the European Continent. In the 19th century, one of the specializations of the Industry in Verviers was wool washing. The characteristic of this industry is to use water in large quantities. The water was provided by the river Vesdre, which flows down the Hautes-Fagnes plateau. The wool-producers requested a rich, stable, and high quality water supply. However, the Vesdre and its tributaries undergo periods of low water during the summer. It explains why a dam was built, in 1875, on the river Gileppe, a river originating in the Hautes-Fagnes plateau, to secure the water supply for the wool-producers. From the beginning of the 20th century, Verviers, at the same level as Bradford, is considered as "wool capital of the world". In Verviers, there were important social differences between people, and we can still see the signs in the city. The working population lived in the lower city, in the industrial suburbs and on the right bank of the river Vesdre, where there was a mixed-use development of dwellings and factories. After the First World War, the first economic and social crisis and the relocation of the industry led to the decline of the Verviers industry. In the fifties, Verviers experienced the collapse of the wool industry and the disappearance of the related industries. The population employed in the wool industry represented 20 000 people in 1950, and only 1200 in 2000. The different areas of the Prés-Javais district remind us of the past and reflect the city's transformation.

The Simonis residence is an old textile industry restored and converted in local authority housing. The residence is located close to the Vesdre and was built on the site of a mill, where William Cockerill, hired by Iwan Simonis, established the first spinning machine in the "Old Europe".

The Raymond Street reminds us the first name of the rich wool-owner Raymond de Biolley (1789-1846) and his social and paternalistic concerns. The "Cité des Grandes Rames" is one of his achievements. The objective was to build local authority housing in order to offer the possibility of accommodation to the working class. The housing estate was composed of small single family houses 6m wide and 6.5 m deep, with a kitchen, rooms, a loft and a small kitchen garden.

The "Récollets" path follows the river Vesdre in the lower part of the stepped left bank of the river, from the bridge "al Côte" and the bridge "Récollets" extended to the "Chemin des tailles". It represents a strip of greenery on the bank of the immediate city centre. Walkers can see specimens

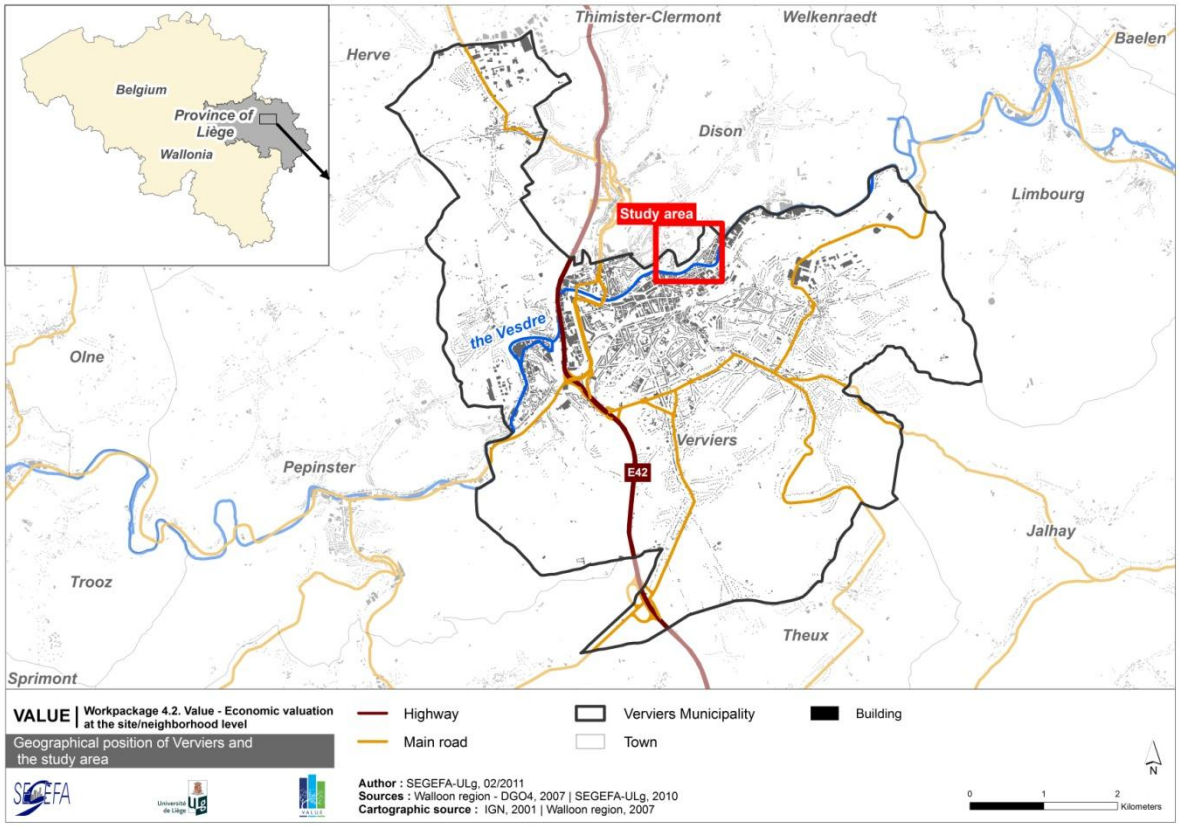
[2] The term "study area" designates the districts of Mamelon Vert, Prés-Javais and Saint-Remacle.

of exotic flowers, which are associated with the wool history of Verviers. The seeds of flowers from Australia, South Africa or Argentina arrived caught on the wool and were released through the process of carding and washing (Coulont, 2002; Maison du Tourisme du Pays de Vesdre, undated).

1.1.2 River Vesdre as a structured element of the city

The Belgium-German River Vesdre flows through the City of Verviers from East to West. The river Vesdre flows through the East of the Belgium, the "Hautes Fagnes", from the German city of Konzen located in the Eifel Region; it is a tributary of the River Ourthe, which is itself a tributary of the River Meuse. The Vesdre water which comes mainly from the "Hautes Fagnes" is very poor in minerals, which made it ideal for washing wool. This encouraged the development of textile industry in the valley in the 19th century (Coulont, 2002; Maison du Tourisme du Pays de Vesdre, undated). Figure 3 presents the geographical position of Verviers and the case study area.

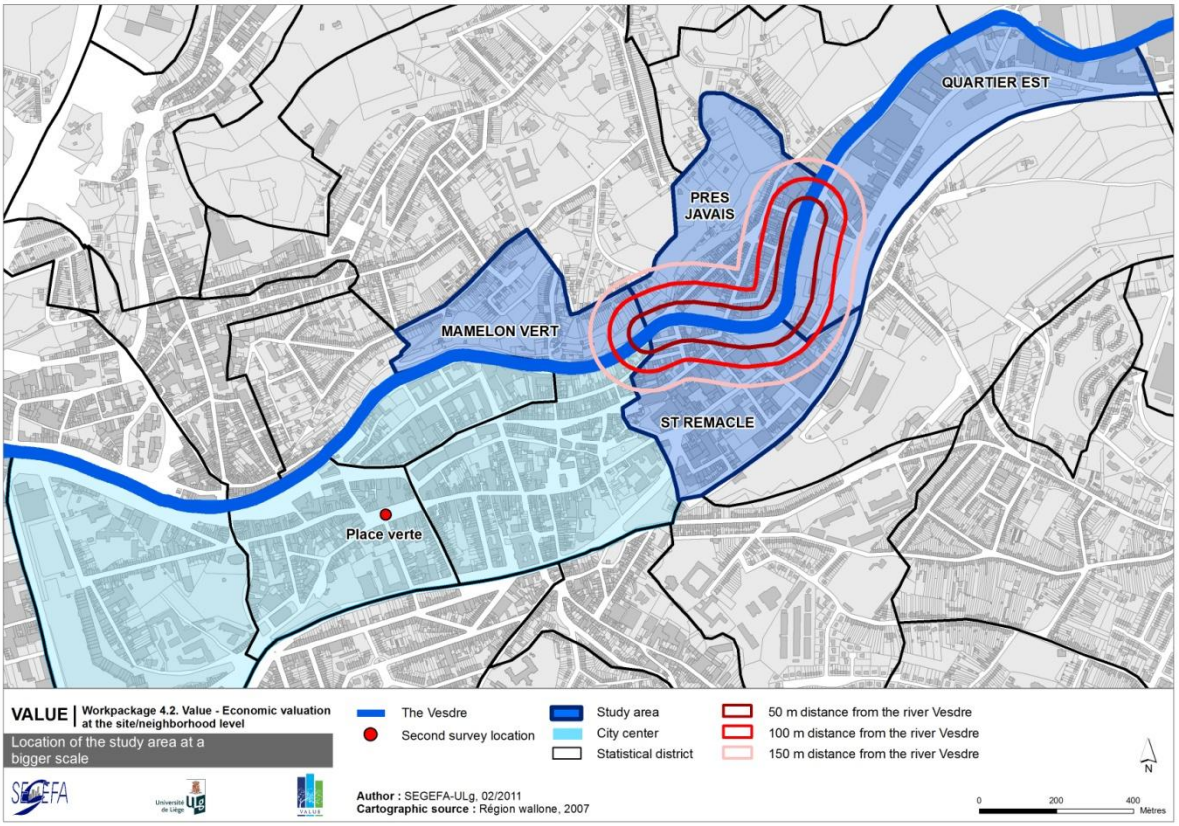
Figure 3: Geographical position of Verviers and the case study area at a small scale



Source: SEGEFA-ULg, 2011.

The study case area is located within a 150-meter buffer from the future green infrastructure project. As figure 4 shows, the study area is essentially composed of four statistical districts: “Mamelon Vert”, “Prés-Javais”, “Quartier Est” and “Saint-Remacle”.

Figure 4: Location of the study area at a bigger scale



Source: SEGEFA-ULg, 2011.

1.2 Socio-demographic profile of the population living in the area

The sociological analysis aims firstly to describe the statistical districts, in which the study area is located, and secondly to give useful figures in order to determine if the sample is representative of the target population.

The following headings will be explored at the scale of Verviers municipality and case study area:

- Population
- Gender
- Age
- Employment and unemployment
- Household composition
- Housing ownership
- Possession of a car and bicycle
- Income level

The latest population census was conducted in 2001. Since then, the Belgian Federal Government has not conducted any census. The census data are updated through the register of births, marriages and deaths.

The study area encompasses four Verviers statistical districts, which are the smallest administrative unit for which data are available. The statistical districts studied are: “Mamelon Vert”, “Prés-Javais”, “Saint-Remacle”, “Quartier Est”.

1.2.1 Population

As table 1 indicates the overall population of Verviers is 55,253 (SPF Economie, 2010). The population has increased by more than 4% between 2001 (52,981 people) and 2010 (55,253 people). The population trend in Verviers matches the one in Province of Liège. The development of the population size between 2001 and 2009 is positive for Prés-Javais (19%) and Quartier Est (8%) statistical districts and negative for Mamelon Vert (-12%) and, to a lesser extent, for Saint-Remacle statistical districts (-1%).

Table 1: Development rate of the population in the study area from 2001 to 2009 / 2010*

	2001 *Absolute value*	2009 2010* *Absolute value*	Evolution 2001-2009 2001-2010* *%*
Mamelon Vert	481	424	-11.85%
Prés-Javais	981	1,163	18.55%
Quartier Est	265	285	7.55%
Saint-Remacle	919	908	-1.20%
Total	2646	2780	5.06%
Verviers	52,981*	55,253*	4.29%*
Province of Liège	1,022,763*	1,067,685*	4.39%*

Source: SPF Economie, 2001, 2009 and 2010*.

Table 2 shows the proportion of foreigners in the study area in 2009 and in Verviers and Province of Liège in 2010. The results highlight the importance of the foreign population in the total population of Quartier Est (25%), Prés-Javais (21%) and Saint-Remacle (19%). The foreign population is less important in the district of Mamelon Vert (8%).

Table 2: Proportion of foreigners in the study area in 2009 / 2010*

	Belgian *Absolute value*	Belgian *%*	Foreigner *Absolute value*	Foreigner *%*	Total
Mamelon Vert	392	92%	32	8%	424
Prés-Javais	917	79%	246	21%	1,163
Quartier Est	215	75%	70	25%	285
Saint-Remacle	731	81%	177	19%	908
Total	2255	81%	525	19%	2780
Verviers	49,444*	89%*	5,809*	11%*	55,253*
Province of Liège	955,215*	89%*	112,470*	11%*	1,067,685*

Source: SPF Economie, 2009 and 2010*.

Table 3 illustrates the development rate of the foreign population between 2001 and 2009. It shows that the foreign population is significantly decreasing in the statistical districts of Saint-Remacle (-12%). The Belgian population is strongly increasing in the Prés-Javais, and to a lesser extent, in Quartier Est statistical districts. The foreign population increases significantly by 19% in Mamelon Vert and 8% in Quartier Est statistical districts and the Belgian population fell significantly by -14% in Mamelon Vert and decreases slightly in Quartier Est statistical district. Mamelon Vert and Quartier Est statistical districts welcomed more foreign people than Saint-Remacle and Prés-Javais statistical districts between 2001 and 2009, and lost more and less the same proportion Belgian people.

Table 3: Annual development rate of the foreign population between 2001 and 2009 / 2010*

Development rate between 2001- 2009 and 2001-2010*	Belgian *%*	Foreigner *%*	Total population *%*
Mamelon Vert	-13.66%	18.52%	-11.85%
Prés-Javais	21.78%	7.89%	18.55%
Quartier Est	-0.46%	-1,66%	7.55%
Saint-Remacle	1.95%	-12.38%	-1.20%
Total	5.37%	3.75%	5.06%
Verviers	4.66%*	-0.99%*	4.29%*
Province of Liège	5.45%*	42.86%*	4.39%*

Source: SPF Economie, 2001-2009 and 2010*.

1.2.2 Gender

Table 4 describes the gender repartition of the population and table 5 the development rate of the male and female population between 2001 and 2009. We can see from this table that the female population is over-represented in Mamelon Vert and under-represented in the three other statistical districts. The development rate between 2001 and 2009 of the male and female population is negative for Mamelon Vert statistical district. The development of the female population is also negative for Saint-Remacle statistical district. The development is positive in all other cases.

Table 4: Gender repartition in 2009 / 2010*

	Male *Absolute value*	Female *Absolute value*	% Female	Total *Absolute value*
Mamelon Vert	204	220	52%	424
Prés-Javais	596	567	49%	1,163
Quartier Est	146	139	49%	285
Saint-Remacle	485	423	47%	908
Total	1431	1349	49%	2780
Verviers	26,658*	28,595*	52%*	55,253*
Province of Liège	519,727*	547,958*	51%*	1,067,685*

Source: SPF Economie, 2009 and 2010*.

Table 5: Development rate between 2001-2009 / 2001-2010*

Development rate between 2001–2009 and 2001-2010*	Male %	Female %	Total population %
Mamelon Vert	-15.35%	-8.33%	-11.85%
Prés-Javais	15.73%	21.67%	18.55%
Quartier Est	10.61%	4.51%	7.55
Saint-Remacle	1.89%	-4.51%	-1.20%
Total	4.91%	5.23%	5.06%
Verviers	3.99%*	4.57%*	4.29%*
Province of Liège	4.74%*	4.06%*	4.39%*

Source: SPF Economie, 2001-2009 and 2010*.

1.2.3 Age

Table 6 shows the distribution by age of the population. The development of the population aged between 20 and 29 years old is only negative for Mamelon Vert statistical district. 30-49 year-old age group shows a negative development in Quartier Est statistical district. 50-59 year-old age group shows the same trend in Mamelon Vert statistical district. The four statistical districts lost population over 60 years old. The decrease of the age group over 60 years old is stronger for Quartier Est and Mamelon Vert than for the other statistical districts. At the scale of the city, Verviers won population of all ages. We should point out that the development rate for the city of Verviers is positive but significantly lower than for the statistical districts of the study area. The development rate for the city of Verviers is higher for people aged between 50 and 59 years old.

Table 6: Distribution by age and development rate between 2001-2009 / 2001-2010*

		20-29 years old			30-49 years old			50-59 years old			Over 60 years old			Total
		Absolute value 2009 and 2010*	%	Development 2001-2009 2001-2010*	Absolute value 2009 and 2010*	%	Development 2001-2009 2001-2010*	Absolute value 2009 and 2010*	%	Development 2001-2009 2001-2010*	Absolute value 2009 and 2010*	%	Development 2001-2009 2001-2010*	
Mamelon Vert	130	43	9%	-21.82%	144	31%	2.13%	50	11%	-12.28%	94	20%	-14.55%	461
Prés-Javais	309	160	16%	2.56%	284	28%	11.81%	118	11%	3.51%	161	16%	-2.42%	1,032
Quartier Est	78	49	18%	28.95%	71	26%	-16.47%	35	13%	20.69%	35	13%	-16.67%	268
Saint-Remacle	349	177	17%	36.15%	288	27%	6.67%	100	10%	7.53%	136	13%	-3.55%	1,050
Total	866	429	15%	13.19%	787	28%	4.93%	303	11%	3.41%	426	15%	-6.99%	2,811
Verviers	14,222*	7,776*	14%*	6.32%*	14,286*	26%*	0.03%*	6,913*	13%*	17.23%*	12,056*	22%*	3.21%*	55,253*
Province of Liège	249,978*	135,678*	13%*	5.55%*	292,533*	27%*	-2.09%*	145,935*	14%*	21.27%*	243,561*	23%*	7.23%*	1,067,685*

Source: SPF Economie, 2001-2009 and 2010*.

1.2.4 Employment and unemployment

Table 7 describes the unemployment rate[3]. We can see that the unemployment rate of the study area (35%) is 15 points above the unemployment rate of Verviers (20%) and 19 points above the unemployment rate of Province of Liège. Mamelon Vert is the statistical district in the study area with the smallest unemployment rate and Prés-Javais the highest.

Table 7: Unemployment rate in 2001

	Working population			Total
	Occupied population	Not occupied population	Uemployment %	
Mamelon Vert	152	42	22%	194
Prés-Javais	197	137	41%	334
Quartier Est	64	38	37%	102
Saint-Remacle	196	112	36%	308
Total	609	329	35%	938
Verviers	16,873	4,166	20%	21,039
Province of Liège	359,135	67,160	16%	426,295

Source: SPF Economie, 2001.

1.2.5 Household composition

Table 8 deals with the household composition of the "Verviétois" families. An important point to note is that the single household seems to be the family type the most common in Verviers and in particularly in the statistical district of Quartier Est.

Table 8: Household composition in 2009

	Single household		2-person households		3-person households		4-or-more-person households		Total
	Absolute value	%	Absolute value	%	Absolute value	%	Absolute value	%	
Mamelon Vert	84	44%	53	27%	22	11%	34	18%	193
Prés-Javais	242	46%	125	24%	67	13%	95	18%	529
Quartier Est	80	55%	24	16%	21	14%	21	14%	146
Saint-Remacle	198	49%	72	18%	47	12%	84	21%	401
Total	604	48%	274	22%	157	12%	234	18%	1,269
Verviers	10,843	43%	6,736	27%	3,156	13%	4,330	17%	25,065
Province of Liège	178,538	38%	139,438	30%	69,152	15%	84,346	18%	471,474

Source: SPF Economie, 2009.

[3] The *unemployment rate* is defined as "the percentage of unemployed people in the labour force (i.e. occupied labour force and the unemployed)" (INSEE, extracted from http://www.insee.fr/en/methodes/default.asp?page=definitions/taux-chomage.htm on 07/09/2011).

1.2.6 House ownership

Table 9 describes the ownership rate. It shows that the percentage of owner-occupied housing units is smaller in Quartier Est (26%) followed by Saint-Remacle (36%) statistical districts in comparison with the two other statistical districts. The percentage of owner-occupied housing units is bigger in the Prés-Javais and Mamelon Vert statistical districts than in the two other statistical districts.

Table 9: Ownership rate in 2001

Number and rate of owner-occupied housing units

	Absolute value	%	Total
Mamelon Vert	129	62%	208
Prés-Javais	160	40%	398
Saint-Remacle	108	30%	364
Quartier Est	30	26%	114
Total	427	39%	1,084
Verviers	28,992	59%	49,157
Province of Liège	261,550	62%	418,559

Source: SPF Economie, 2001.

1.2.7 Car and bicycle ownership

Table 10 presents the assets possession (car and bike) of the "Verviétois". The most significant fact is that 59% of households in the Mamelon Vert statistical district are in possession of one or more cars which is above the percentage of households owning a car in the other statistical districts of the study area. Quartier Est is the statistical district, where there are more households in possession of one or more bicycles (30%).

Table 10: Car and bicycle ownership per household in 2001

	Car							Bicycle						
	0		1		2-or-more			0		1		2-or-more		
	Absolute value	%	Absolute value	%	Absolute value	%	Total	Absolute value	%	Absolute value	%	Absolute value	%	Total
Mamelon Vert	76	37%	109	52%	14	7%	208	145	70%	24	12%	30	14%	208
Prés-Javais	180	45%	188	47%	20	5%	398	310	78%	48	12%	30	8%	398
Quartier Est	59	52%	46	40%	4	4%	114	75	66%	22	19%	12	11%	114
Saint-Remacle	173	48%	156	43%	23	6%	364	271	74%	55	15%	26	7%	364
Total	488	45%	499	46%	61	6%	1,084	801	74%	149	14%	98	9%	1,084
Verviers	6,997	32%	10,991	51%	3,153	15%	21,744	13,980	64%	3,381	16%	3,780	17%	21,744
Province of Liège	107,662	26%	219,453	52%	81,633	20%	418,559	226,632	54%	79,003	19%	103,113	25%	418,559

Source: SPF Economie, 2001.

1.2.8 Average income per person

Table 11 indicates the average income per person in 2002 and 2008. It is quite clear from this data that the statistical districts composing the study area are poor. These results confirm the fact that the study area's unemployment rate (35%) is significantly higher than for the city of Verviers (20%). The development of income is positive for the inhabitants of the three statistical districts but less important for the Prés-Javais than for the Mamelon Vert or Saint-Remacle statistical districts.

Table 11: Average income per person in 2002 and 2008

	Average income per person		
	2002	2008	Development
Mamelon Vert	8,431	12,590	49.33%
Prés-Javais	5,854	7,487	27.89%
Quartier Est	-	-	-
Saint-Remacle	5,347	8,304	55.30%
Total (without Quartier Est)	6,179	8,652	40.02%
Verviers	9,767	12,019	23.06%
Province of Liège	10,648	13,587	27.60%

Source: SPF Economie, 2002-2008.

1.2.9 Intermediate conclusion

We can conclude from the data presented above that the study area is poorer than the city of Verviers in terms of its social and economic dimensions. The four statistical districts composing the study area, namely “Mamelon Vert”, “Saint-Remacle”, “Prés-Javais” and “Quartier Est”, show a positive development of the population (+5.06%). The foreign population of the four statistical districts has increased of 4.82%. The foreign population increases significantly in Mamelon Vert and slightly in Prés-Javais statistical districts. In Quartier Est and Saint-Remacle, the development of the foreign population is negative. The population is predominantly masculine. We would like to point out that in the Mamelon Vert statistical district the male and female populations decrease markedly. Concerning the distribution by age, the population over 60 years old decreases in all statistical districts. Only Mamelon Vert and Quartier Est show a population decline for the other age groups from 20 to 59 years old. 35% of the population is unemployed in the four statistical districts, which is above the rate for Verviers (20%) and Province of Liège (16%). Concerning the household composition, single household is the principal household type. The ownership rate is slightly lower for the four statistical districts than for Verviers and Province of Liège. 52% of the population living in one of the four statistical districts own at least one car. The percentage of people owning a car is lower in the case study area than in Verviers (66%) and in the Province of Liège (72%). The average income has increased more rapidly for the four districts than for Verviers and Province of Liège. According to socio-economic data, the case study area is poorer than the City of Verviers. Nevertheless, the population of the study area has increased more rapidly (5.06%) than in the City of Verviers (4.29%) since 2001.

1.3 Description and location of the green infrastructure project

1.3.1 Definition of green infrastructure

The Green Infrastructure Worksheet (Town and Country Planning Association, 2008, p.5) mentioned that "green infrastructure should be designed and managed as a multifunctional resource[4] capable of providing the landscape[5], ecological services[6] and quality of life benefits that are required by the communities; it serves and is needed to underpin sustainability. Its design and management should also protect and enhance the character and distinctiveness of an area with regard to habitats and landscape types" (Town and Country Planning Association, 2008, p.5).

1.3.2 Description of the green infrastructure project

The Economic Development Agency for the Province of Liege is developing a cycle and pedestrian path in the Prés-Javais district, near the city centre, on the left side of the river Vesdre in Verviers, linking the centre of Verviers to the suburbs. The green infrastructure project aims to create a cycle and pedestrian path on the river bank or on the collector between the "Dardanelle" bridge and the "Epargne" bridge to restore the basic river functions in allowing people to have an access to it for walking and cycling and linking various sized parks and green areas in the urbanized area. The Economic Development Agency for the Province of Liege, which is in charge of creating the path, will also build two terraces, one at the beginning of the "Grande Rames" street and the other one in the "Marie-Henriette" park. From the "Grandes Rames" Street to the "Marie-Henriette" park, there is no access to the river; indeed all houses turn their backs to the river. In order to make the river more attractive it is important to develop river corridors. Figure 5 shows the master plan of the cycle and pedestrian path alongside the river Vesdre.

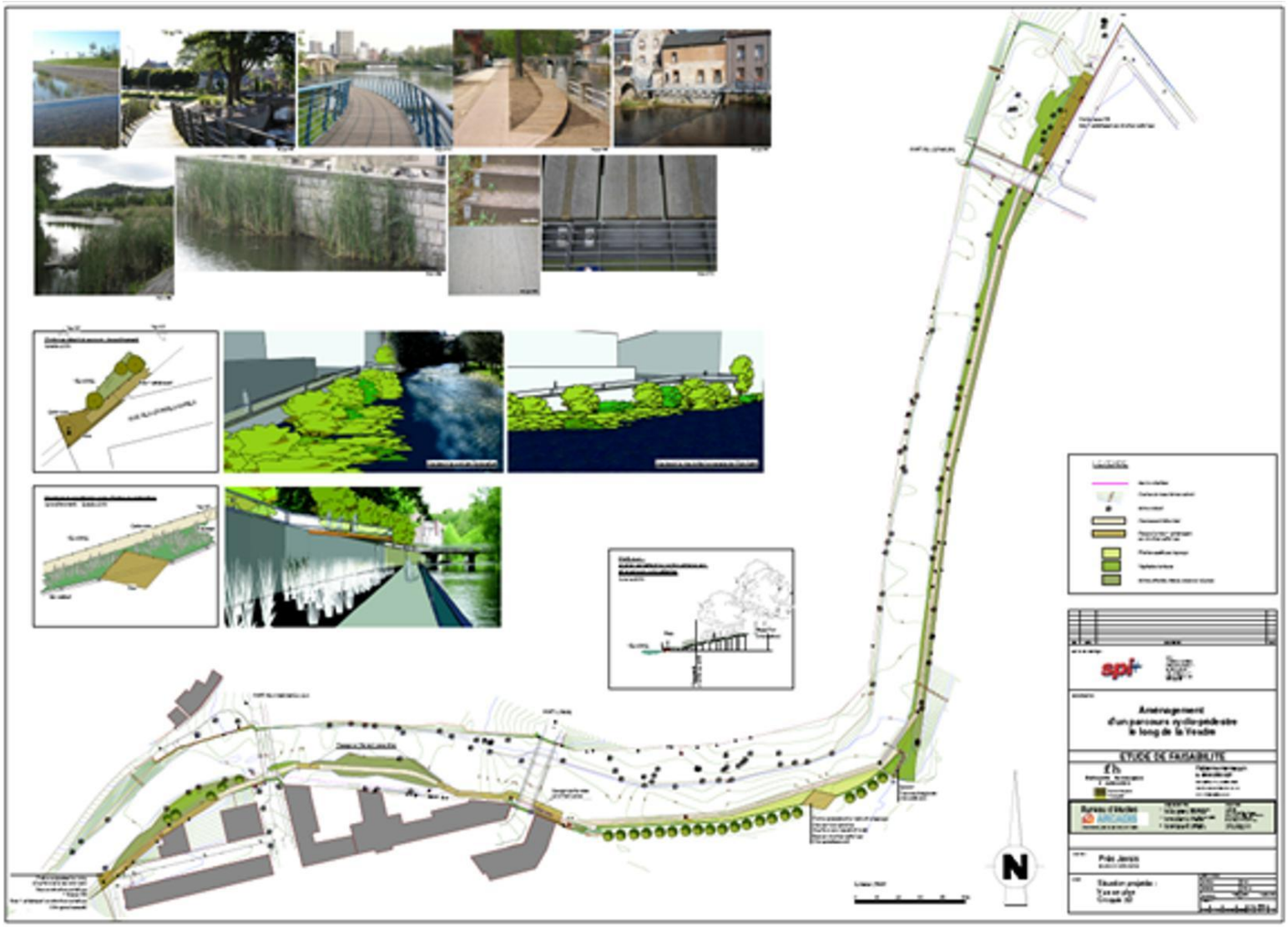
We should remember that the Walloon planning system is divided into two levels: regional and local level. At the regional level, the Regional Spatial Development Plan is an indicative tool for the public authorities. It serves also as references for the Local Structure Plan which is developed at the local level (Philipson, 2011). The Local Structure Plan was approved in February 2011 after 10 years of debate due to majority changes in the city council of Verviers. The document defines two main spatial planning objectives but it is not compulsory. The first objective is to make the bank of the river Vesdre more attractive by developing a cycling and walking path along the river. The second objective is to create a masterplan focused on the development of the city centre. The city council is currently working on the master plan (see appendix 5.1: City Centre Master Plan). The VALUE project came before the objectives of the Local Structure Plan were set.

[4] « Multi-functional is used to include, but not exclusively, the provision of such diverse products and services as agriculture, forestry and horticulture, renewable energy installations and fuel sources, climate change adaptation and mitigation, transportation routes, water management, recreational and sporting activity space, biodiversity, and aesthetics» (Town and Country Planning Association 2008, p.5).

[5] « Landscape is used as defined by the European Landscape Convention: 'an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors'» (Town and Country Planning Association 2008, p.5).

[6] « Ecological is taken here to mean 'relating to the inter-relationship between organisms (including human) and the environment'» (Town and Country Planning Association 2008, p.5).

Figure 5: Masterplan of the cycle and pedestrian path alongside the river Vesdre



Source: Economic development agency for the Province of Liege, 2009.

The main objectives of the green infrastructure project are:
(1) to give access to the river Vesdre to the residents which is “historically hidden behind the backyards or blind walls of houses”(Allin, 2010, p. 46);
(2) to provide an alternative short-cut to the city centre;
(3) to achieve physical and functional connections between cities by linking the different routes of the « autonomous network of pathways for slow traffic »[7] to the city of Verviers. The route 38 (Vaux-sous-Chèvremont – Hombourg) for example could be connected to the VALUE green infrastructure project and to be part of the restoration of the main river functions and enhancement of connections between the river and the local population.
The second set of objectives focuses on the multifunctional aspects of the green infrastructure. Hence, the green infrastructure project aims to encourage alternative modes of transport such as walking and cycling by creating the path and aims to provide outdoor areas by maintaining the path and the surrounding parks, notably the park Marie-Henriette.

1.3.3 Description of the costs

In the application form, it was agreed to design a cycling and walking path along the river Vesdre. The access to the cycle path and the view over the river Vesdre was made easier thanks to the construction of two terraces. The INTERREG IVB funds subsidised 50% of the VALUE investment in Verviers. The other 50 % funds came from the Walloon region and both funds totalled an amount of EUR 250,000.00. The economic development agency for the province of Liège (SPI) organised a public tender. The engineering consultants group Arcadis/Fabienne Hennequin was designated to conduct a feasibility study and to design the cycle path. The assignment given to Arcadis/ Hennequin was to conduct a feasibility study in order to determine what can be done with the funding available, given that the estimated total cost of the path was EUR 1,200,000.00. According to the budget cost breakdown (made by Arcadis/Fabienne Hennequin), the amount remaining for the building work of the path was EUR 150,000.00. No other sources of funds could be found to complement VALUE funding scheme. Hence, SPI decided to pursue the VALUE project by building the two terraces. Following this decision, a first estimated quotation for the construction of the two terraces was made by Arcadis/ Hennequin in 2011 (see table 53, p. 100). Then, SPI invited companies in autumn 2011 to submit bids in a tender for the public building contract aiming at building the two terraces. It was clear that the cost required for building the two terraces was far higher than expected. Finally, it was decided to build one terrace, probably the one at the beginning of the path, with the funding available. The building of the terrace will be undertaken in spring 2012.

[7] **“**Autonomous network of pathways for slow traffic” is the name given in Wallonia to green trails. It comes from the French name "RAVeL", meaning "Réseau autonome de voies lentes" (Braives - website 2011).

2 BOTTOM-UP APPROACH: ECONOMIC VALUATION

2.1 Methodology

2.1.1 General overview

Evaluation methods: The approach that we used in this report to estimate the economic valuation of green infrastructure was described in the final report of the Action 1.2 Baseline Analysis of Existing Economic Valuation Tools for Application of Green Infrastructure Investments (Allin, 2010). For data availability reasons and to elicit the motive of the respondent's preferences, we decided to implement a stated preference study to estimate economic values.

In this part, we will review the different evaluation methods used, namely contingent valuation and choice modelling methods, which are both expressed/stated preference techniques. We chose to use stated methods analysis instead of revealed methods analysis because of acknowledged difficulties in obtaining suitable data to proceed with a revealed preference study. Moreover, revealed preference techniques can not identify non-use values. Because of likely importance of non-use values, we decided to choose stated preference techniques (Pearce, 2002, p.32).

Contingent valuation method (CV) and choice modelling method (CM) are both stated preference method, which are based on a questionnaire revealing the economic value through a hypothetical or constructed market. "They ask people what economic value they attach to those goods or services" (Pearce 2002, p.16). At the beginning of our study, we selected the contingent valuation approach to estimate economic values of the green infrastructure. The contingent valuation approach was chosen because all aspects of the project were known and the interest was to elicit respondents' WTP for the creation and maintenance of the green infrastructure. Nevertheless, the methods used for the evaluation of non-use benefits such as existence values, have been the subject of criticism, because some respondents can refuse "to play the game" and give a zero WTP as a protest against paying for a good that should be free for all. Choice modelling approach elicits respondents' WTP indirectly by asking them to choose, rank or rate the goods or services. It explains why we finally decided to use both choice modelling plus contingent valuation approach, in order "to increase the robustness [of the analysis] and to check the underlying components of values" (Pearce, 2002, p.32).

2.1.1.1 Debates and processes

The aim of the present study was to measure economic value of the green investment made in the framework of the Value project. We developed a methodology based on evaluation techniques to achieve the double objectives of, firstly, assessing the economic value of green investment, and secondly, helping planners to know how to target their investment. The process of creating CV and CM which was used for measuring the WTP of the green investment for residents is developed below[8]. We faced few problems in terms of developing the methodology of the choice modelling tool.

Three scenarios (natural plant cover; barren path scenario and structured plant cover) have been developed. For constructing the scenario, we proposed a set of common attributes, namely degree

[8] As described in point 2.1.2 and following points.

of transparency and luminosity, structure of green space, safety and security of the green infrastructure, maintenance of the green infrastructure and cost. The level of the attributes varied according to the scenario. A handmade sketch was drawn for each scenario (see page 35). The aim of handmade sketches was to offer visual aids with the questionnaires to the respondents. The difference between the attribute levels should have been represented on the handmade sketches. We could see on the sketches the difference between the levels of the following attributes "degree of transparency and luminosity" and "structure of green space". The attribute "degree of transparency and luminosity" has been represented by varying the quantity of vegetation from no vegetation for the barren path scenario to abundant vegetation for the structured plant cover going by the less abundant vegetation for the *natural plant cover* which is the status quo. The attribute "structure of green space" varies from "barren" for the barren path scenario to "structured" for the structured plant cover. The structure of green space remains "natural" for the status quo. Nevertheless, the variations in the attributes "safety and security of the green infrastructure" and "maintenance of the green infrastructure" have not been represented on the handmade sketches. Because of the non-representation of certain attributes on the handmade sketches, we decided to leave the opportunity to respondents to give their own WTP for each scenario. As a result, the CM was not a true CM experiment; it has moved towards being CV. Nevertheless, our study applied win-win approach for all stakeholders. It enabled respondents to value different types of scenario; to see the potential benefits of green infrastructures can provide; to think about their effective use of current and future green infrastructures when given their WTP. The researcher had the opportunity to elicit WTP values of respondents and to determine if the choice of the respondents was consistent with the planner's suggestion to create a natural vegetal path (corresponding to the status quo scenario).

2.1.1.2 Respondent's perception

Different variables can affect the respondent's perception. Identifying perceptions can contribute to understand landscaping behaviour of the respondents. The variables affecting the perceptions are:

- Level of education: "Higher levels of education have generally been shown to be associated with higher scores in environmental perspectives" (Bogner F.X., 1997, p.113).
- Age: "If respondents' backgrounds factors were to be taken into account, age may be seen as having had a great influence in this classification (Asakawa S., 2004, p.175)." The environmental perception can be different according to the age of the participants as Asakawa and Bogner highlighted. "The age of the participants has been proven to influence the subscales taken for this present study: the younger the pupils, the more sensitive they are towards nature and conservation and the more willing to behave in an environmentally sound manner" (Bogner F.X., 1997, p.114).
- Other background: Other residents' background factors, such as their gender, length of residence in the area, income, and number of persons per household can affect how they frequent the streams and then their perception.
- Experience: According to Le Lay (2005, p.2-3), landscape is a source of visual information, to which people give meaning to experience, past, expectations and social and cultural environment. As described above the Vesdre's River flows through the area under study. As Ryan (1998, p.225) mentioned, residents could see the river corridor as the interconnection

of different landscape types. Three interconnected landscapes, namely the river, woods and built-up area, are present on the river Vesdre bank. “Water combined with forest vegetation strengthens the aesthetic quality of landscapes” (Le Lay Y-F, 2005, p.13). How respondents have experienced the landscape in the past can have an influence on their perception. People’s perceptions of fluvial landscapes, for example, can be related to the risks linked to flooding and recreational activities. Most people use strong adjectives such as “beautiful” to describe the landscape and more particularly the structured plant cover. Most of them have the same mental representations of the landscape type (Hagerhall C.M., 2001, p.83-84).

2.1.1.3 Questionnaire

To carry out the stated preference study, which will be described below, we developed a questionnaire with visual aids and the collection of data has been done through face-to-face interviews.

The two different valuation techniques applied to the Verviers case study have been analyzed through the same questionnaire (see questionnaire in appendix 5.3). The questionnaire encompasses the choice modelling question aiming to ask the choice preferences of the respondents and the contingent valuation question with the objective to know the WTP of the respondents.

The questionnaire is composed of four parts:

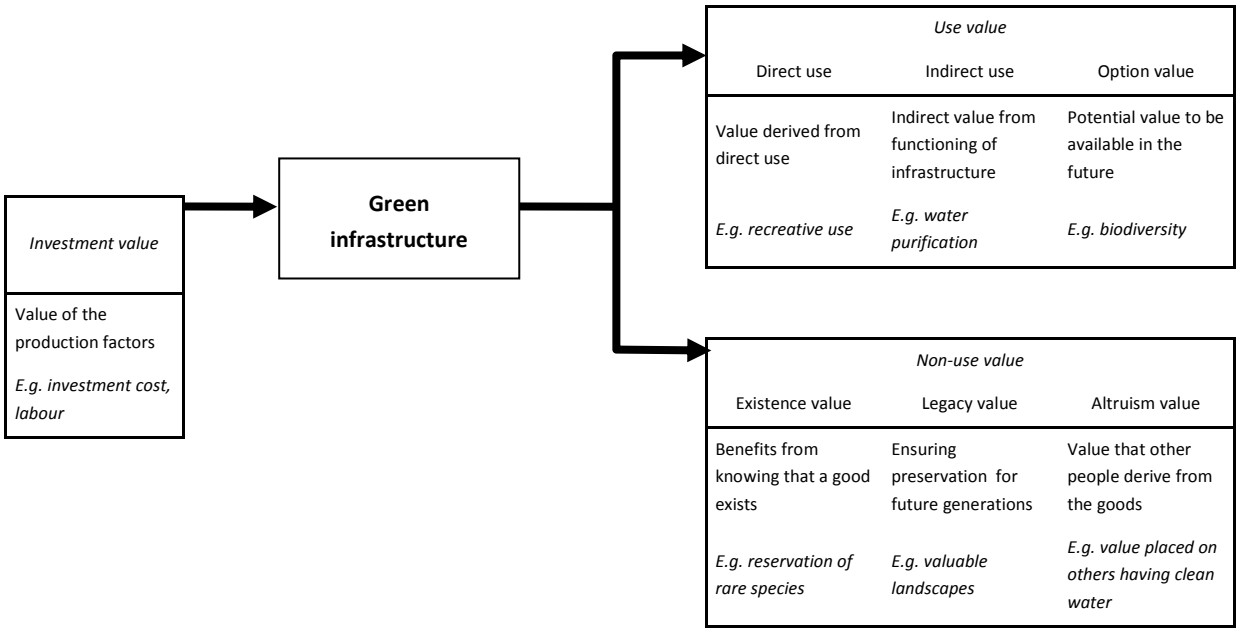
- the first section describes the project and asks the respondents about their environment;
- the second part deals with the contingent valuation part;
- the third part with the choice modelling part;
- the fourth section asks few socio-demographic questions.

2.1.2 Contingent valuation method

2.1.2.1 Description of the method

The contingent valuation method is a stated preference method, which aims to ask people directly through a questionnaire their maximum willingness to pay (WTP) or their minimum willingness to accept (WTA) (‘What are you willing to pay?’ or ‘Are you willing to pay €X?’) in compensation for a specific change of the quality of their environment. The objective of the method is to estimate use and non-use values of the goods or services proposed. Figure 6 shows the use, non-use and investment value that a green infrastructure entails. As Vermeire *et al.* (2009, p.30) highlight, the objective of valuation in CBA is to analyse if the benefits of the project (use and non-use value) counterbalance the costs (investment value). Contingent valuation is referred to as a stated preference method and by consequent the contingent valuation technique is based on the respondents’ answer of the questionnaire instead of the observation of respondents’ behaviours.

Figure 6: Economic value of green infrastructures



Source: Vermeire *et al.* 2009, p.6

The method implies the development of a hypothetical scenario alongside the questionnaire. For this, we organized focus groups in order to design the survey. The businesses and residents focus groups were selected and organized by the economic development agency for the province of Liège (SPI). The participants of the focus groups (Moreau et al., 2010) were not a random selection of the population. The objective of the focus group was to determine what background information was needed, how to present it, which visual aids could be used, and to help in developing more specific questions.

We used visual aids to present the project and to show the different scenarios. The visual aims to help the interviewer to define the services or goods which are being valued by the respondents.

We administered the questionnaire through face-to-face interviews, which gave us more flexibility to present the background information, to ask complex questions and to use visual aids. Moreover respondents are more likely to complete a long survey in personal interviews.

In order to avoid bias in administering the questionnaire, we have made clear to the respondents that the project could be done within budget constraints and they have the right to refuse to pay for the goods or services.

2.1.2.2 Questionnaire design

The text of the questionnaire is in appendix 5.3.

The contingent valuation part of the questionnaire was developed according to the recommendations of the National Oceanic and Atmospheric Administration's (NOAA) (Arrow, 1993).

Sébastien Terra (2005) applies these recommendations in his Good Practice Guide for carrying out contingent valuation study. We took into account the above-mentioned Good Practices Guide and NOAA recommendations in designing the questionnaire. Different parts of the questionnaire were tested through focus groups and stakeholder interviews and the questionnaire design was peer-reviewed. The questionnaire was pilot-tested on site over one day. The objective was to test the questionnaire with the first ten random selected households. All the questions were understood by the respondents but the questionnaire didn't receive a 'warm welcome' on that day because it had snowed and the streets of the study case area hadn't been plowed at that time. People were too occupied with plowing the snow off the road and angry with the city council, which according to them plowed and salted all city centre streets and seemed to forget the streets of the Mamelon Vert, Prés-Javais, Quartier Est and Saint-Remacle districts.

A few days later, we began to administer the questionnaire to the full sample.

2.1.2.3 Structure of the questionnaire

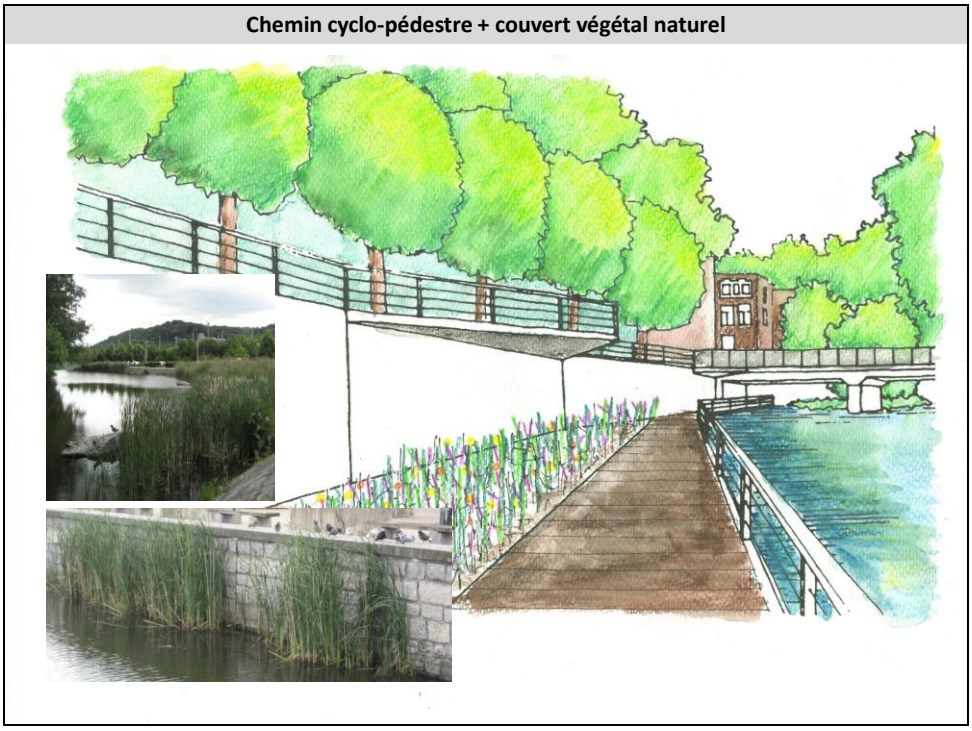
The questionnaire begins with questions about the use of the good or service in order to get an insight into respondents' familiarity with the good or service and to determine the users and non-users of the good or service in question. The "Récollets" path allows us to distinguish greenway users from non-users. Then, the questionnaire focuses on asking the respondents their WTP on the status quo scenario before presenting the other choices. We continue the questionnaire with questions on their use habits of green infrastructures, such as park visits, and then their socio-demographic characteristics.

2.1.2.3.1 Hypothetical scenario

In general, the valuation scenario describes the good or service and the nature of the change of that good or service as well as the institution in charge of providing the good or service. By giving the valuation scenario, we try to make sure that people believe in the project and in the institution for providing the good or service. We already try to make sure that their voices are heard.
More specifically, the hypothetical scenario represents the development of a *natural plant cover* along the cycling/pedestrian path. The maintenance of the green area will be low and focus on the management of invasive plant species and the vegetation of the "Marie-Henriette" park will be improved.

The scenario showing a cycling/pedestrian path with a surface of natural plant is represented in figure 7.

Figure 7: Situation of reference: natural plant cover



Source: LEMA-ULg & SEGEFA-ULg, 2010; Photo taken by Myriam Auquière.

2.1.2.3.2 Payment vehicle

Payment vehicle provides the context for payment, i.e. the way in which the respondent is expected to pay for the good or service in question. During focus group interviews, we tested different payment vehicles and it becomes apparent that contribution through local tax was the most appropriate.

2.1.2.3.3 Eliciting valuations

For the WTP question, different elicitation formats can be used: dichotomous, open-ended, payment card and bidding game. Table 13 summarises the most popular elicitation formats. We highlighted in grey the elicitation formats selected for our study.

Table 13: Eliciting valuations

	Description	Advantages	Disadvantages
Open-ended question	Aims to directly ask people what are their maximum WTP for the specific environmental change.	The maximum WTP can be determined for each respondent.	Avoid the "yea-saying" problem but respondents will have to make a difficult decision.
Bidding game elicitation	Asking a sequence of bids until the maximum willingness to pay is found	The given starting value and succeeding bids facilitate the valuation of the good or service by the respondent.	May be subject to "yea-saying", respondents given affirmative answer but possibly false.
Payment card elicitation	Suggesting a certain number of bids which are printed on a card and asking people if any of these bids is close to their maximum WTP	Give to the respondents some context for evaluating the good or service.	Pay attention to the different number bids printed on the card.
Single-bounded dichotomous choice	Suggesting a bid by asking respondents the following question: "Are you willing to pay X EUR: Yes or No?"	Simplify the evaluating task encountered by the respondent.	May be subject to "yea-saying", respondents given affirmative answer but possibly false.
Double-bounded dichotomous choice	A bid is given and according to the respondent's answer to the question "Are you willing to pay X EUR: Yes or No?", a follow-up question based on the response to the initial question will follow.	Allow to elicit more information from the respondent's WTP than single-bounded dichotomous choice.	May be subject to "yea-saying", respondents given affirmative answer but possibly false.

Source: Pearce and Özdemiroglu, 2002, p.50-52.

In the Verviers case study, we chose to combine two types of elicitation valuation questions, namely payment card and dichotomous choice, because they are both recommended. It allows guiding the respondents in determining a price in the valuation process and it gives enough flexibility to allow the respondent to adjust the starting value to the maximum price that he/she is willing to pay.

The elicitation question goes through a process. Firstly, we asked the respondent if he/she would agree to pay 25 EUR per year that is ± 2 EUR per month of council tax for the creation and the maintenance of the green infrastructure. If yes, we asked him/her to give us up to which amount would he/she accept to pay per year of council tax for the creation and maintenance of the green infrastructure? At the same time we asked the question, we showed him/her the table 14. If no, we asked him/her to give us which amount would he/she accept to pay per year of council tax for the creation and maintenance of the green infrastructure? Here, we presented the table 15. Tables 14 and 15 are part of the visual support available in appendix 5.4.

Table 14: People accepting to pay 25€ of local tax per year

Per year (EUR)	**Per month (EUR)**
200	16.66
150	12.50
100	8.33
80	6.67
70	5.83
60	5
50	4.16
40	3.33
35	2.92
30	2.50
25	2.08

Source: SEGEFA-ULg, 2010.

Table 15: People refusing to pay 25€ of local tax per year

Per year (EUR)	Per month (EUR)
20	1.66
15	1.25
10	0.83
5	0.42
0	0

Source: SEGEFA-ULg, 2010.

2.1.2.3.4 Follow-up questions - valid / non-valid responses

Some people gave a zero WTP to the elicitation question. In order to understand the motives behind these zero WTP and to confirm the validity of responses, we pursue the questionnaire with follow-up questions. The objective is to know if the answer represents some forms of protest or simply means that the respondent is not willing to pay anything for the good.

The answers which can be classified as non-valid are:

- respondents who refused to answer the valuation question;
- respondents who don't provide their WTP (answer = 0);
- respondents who provide their WTP but at an unrealistic value in relation to their revenue.

We developed follow-up questions to determine if the WTP answer can be considered as valid or as protest bid in the context of the creation of a pedestrian/cycling path.

Table 16: Answers to the follow-up questions asking why the respondent gives a zero WTP

For which reasons do you not wish to pay?
I shouldn't be the one paying
The district should be the one paying
It is not necessary to modifiy the state of this river
My financial means won't allow me to pay
I don't have enough information on which to base a decision
I am afraid of paying for others
It would prevent me from taking part in my activities
I already pay to take part in a leisure activity
I don't want the river to be modified
I don't feel concerned
Other reasons
(Don't know)

Source: SEGEFA-ULg, 2010.

2.1.2.3.5 Socio-economic characteristics

Finally, the last part of the questionnaire deals with socio-economic characteristics of the respondents. The socio-economic profile of the respondents was identified by collecting the following information: age, sex, present situation (student, worker, social beneficiary or pensioner), education level, household structure, housing situation and income. According to Pearce and Özdemiroglu (2002, p.53), "this information is used to test whether the WTP answers conform to theoretical expectations". The objective is for example to test if the answer of the elicitation question varies with income.

2.1.3 Choice Modelling Method

2.1.3.1 Description of the method

The contingent valuation method used in the first part of the survey aimed at measuring the use and non-use value of the investment done in Verviers through the maximum WTP of the respondent. The contingent valuation method has been criticized because of the difficulties of getting reliable or accurate estimates of the WTP. By consequent, we complete the cost-benefit analysis by undertaking a choice modelling study. The objectives are to confirm the results and to complete the analysis by asking the respondents to state their preferences among alternative scenarios. The same attribute, elicitation question and cost bid were used for both techniques.

Choice modelling method is a stated preference method based on a survey. The main characteristics of the method are that "any good can be described in terms of its attributes, or characteristics, and the levels that these take" (Pearce, 2002, p.54). Choice modelling method elicits responses from respondents for the purpose of choosing an experiment, for ranking or rating a range of alternative scenarios, but not for the purpose of establishing value. The main choice modelling alternatives are: choice experiments, contingent ranking, contingent rating and paired comparisons. The alternative used here is choice experiments, which imply to "choose between (usually) two alternatives, versus the status quo" (Pearce, 2002, p. 54).

2.1.3.2 Questionnaire design

2.1.3.2.1 Selection of attributes and assignment of levels

The focus groups conducted in June/July 2010 helped us to select the attributes (Moreau et al., 2010). Following the data analysis of the focus groups, we chose the attributes described in the table 17 for the goods to be valued. Furthermore, we carried out further interviews with local stakeholders and communities, namely:

- Catherine Lejeune, Deputy mayor for territorial development, urban planning, environment and local heritage of Verviers city;
- Florence Rittweger de Moor**,** Urban officer of Verviers city;
- Bruno Poskin, Green space officer of Verviers city;
- Julie Moreau, Project coordinator, SPI.

Theses interviews allowed us to assign a level to each attribute as illustrated in table 17.

Table 17: Attributes and levels used in the Choice modelling analysis

Attribute	Description	Levels
Degree of transparency and luminosity	**To show the structure and composition of the vegetation.**	**Low (abundant vegetation)** **Medium (less abundant vegetation)** **High (no vegetation)**
Cost	**The cost of the creation and maintenance cycle/pedestrian path per person and per year.**	**Low (<25€ per year)** **Medium (= 25 € per year)** **High (>25€ per year)**
Maintenance of the GI	**Measures to help guarantee the cleanliness of the site.** **Frequency of bin collection, cleaning-up and management**	**Low frequency** **Medium frequency** **High frequency**
Safety and security of the GI	**Measures to help guarantee the safety and security of the park/path.**	**Low (No particular measures)** **Medium (Lighting and closing time of the path and park at nightfall)** **High (Lighting, video surveillance camera, path and park closed at nightfall…)**
Structure of green space	**To identify the different types of green spaces that we can develop with the creation of the cycling/walking path.**	**Barren** **Unstructured (natural)** **Structured**

Source: SEGEFA-ULg, 2010.

2.1.3.2.2 Construction of choice sets and measurement of preferences

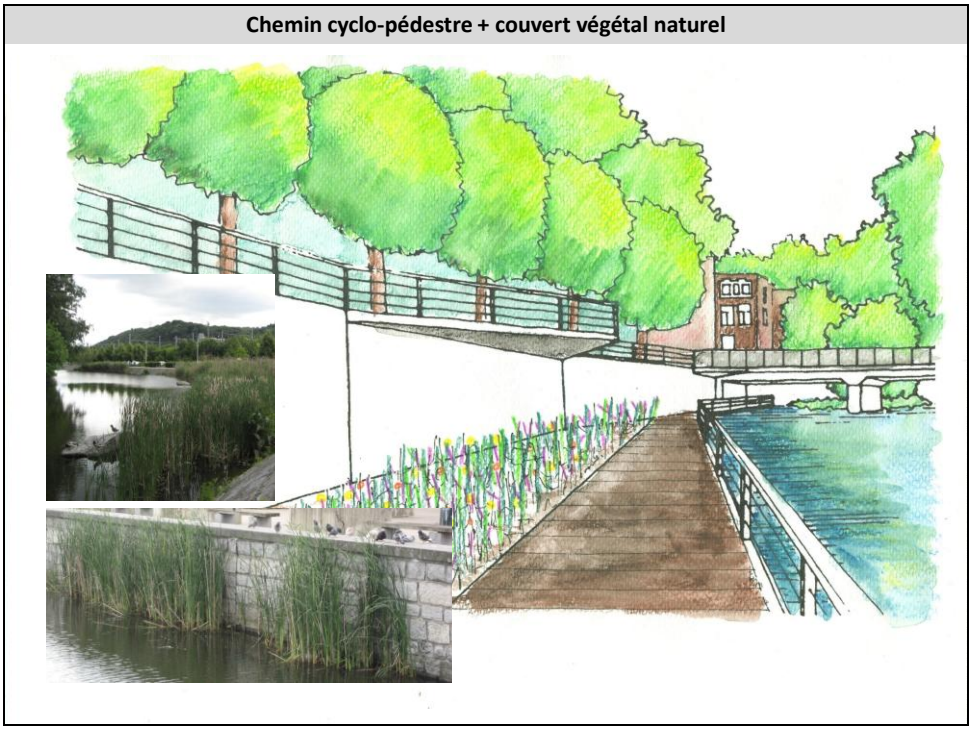
In the choice modelling method, respondents are presented with a series of choices. A choice is a combination of several attributes taking on a value, usually called a level. For the Verviers case study, three choices have been developed: the *barren path* scenario, the *natural plant cover* and the *structured plant cover*. All choices present the above-mentioned alternatives at different levels.

The option of the initial situation (which consisted of no change and no payment) was included in the questionnaire. For each scenario, except for the initial situation, a picture had been drawn:

- The *natural plant cover*, namely the situation of reference, corresponds to the initial change planned by the VALUE project and analyzed through contingent valuation. This scenario encourages the development of a *natural plant cover*. Maintenance is low and focuses on the management of invasive plant species. The vegetation of the "Marie-Henriette" park will be improved (see figure 8 below).
- The *barren path* scenario intends to create a cycle/pedestrian path where there will be no vegetation but a surface of gravel on the river bank and along the path (see figure 9 below).

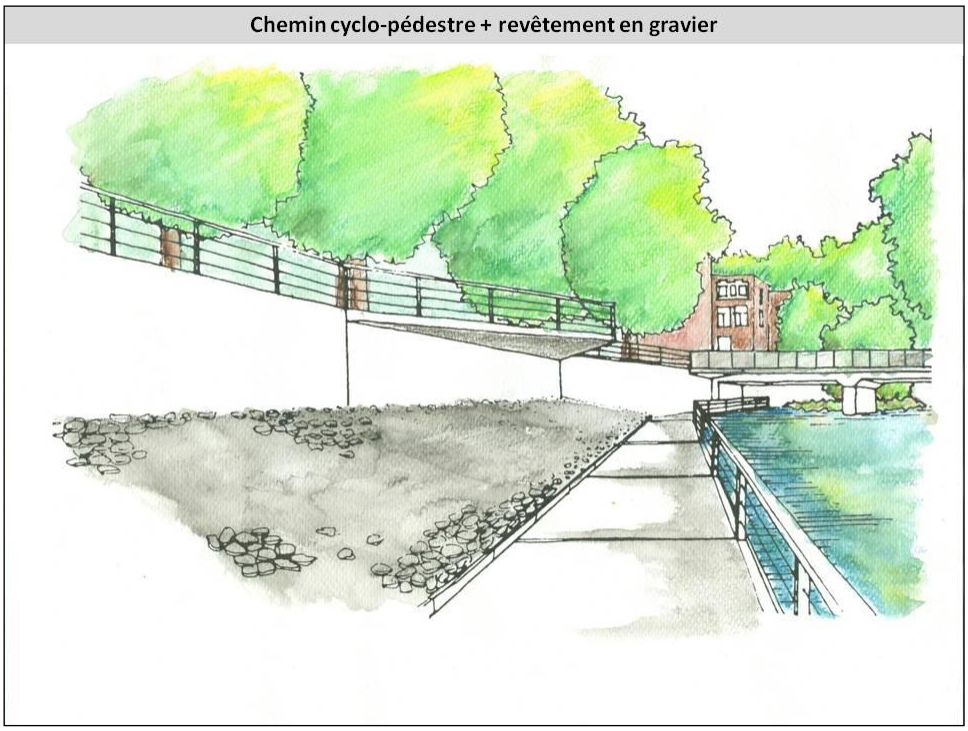
- The *structured plant cover* seeks to create a cycle and pedestrian path with structured and controlled vegetation. This scenario aims to embellish the paths with the help of flowering plants in tubs (see figure 10 below).

Figure 8: Situation of reference: natural plant cover



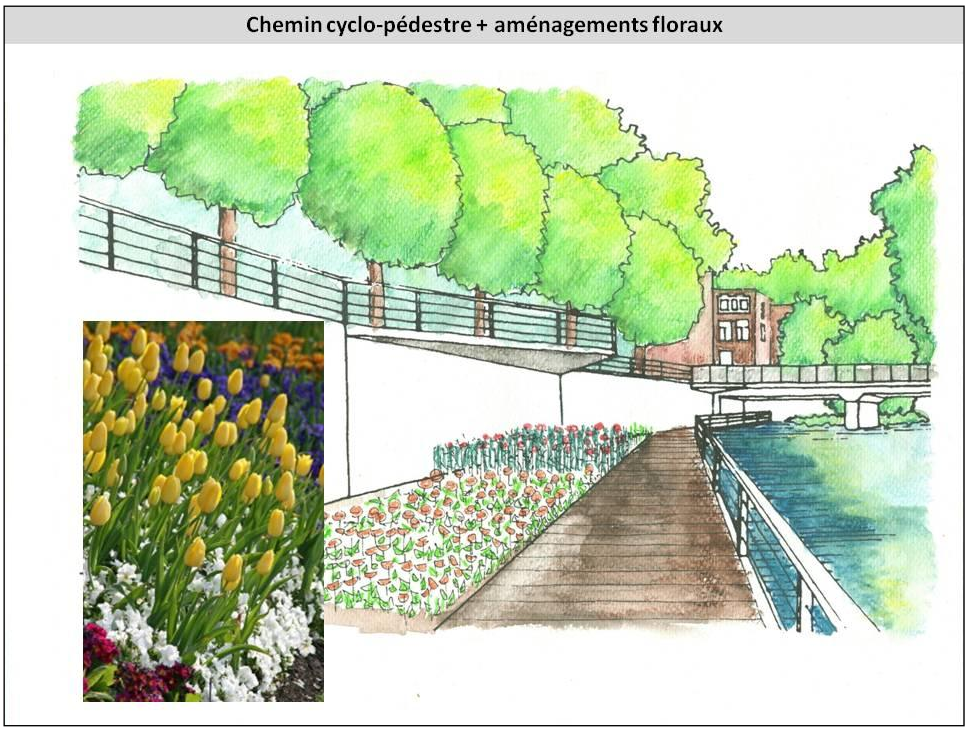
Source: LEMA-ULg & SEGEFA-ULg, 2010; Photo taken by Myriam Auquière.

Figure 9: Barren path scenario



Source: LEMA-ULg, 2010.

Figure 10: Structured plant cover



Source: LEMA-ULg & SEGEFA-ULg, 2010; Photo from iStockphoto.

2.1.3.2.3 Choice of experimental design

"The choice experiments present respondent with a baseline scenario corresponding to the status quo [namely, the *natural plant cover*] and several alternative options [namely, the *barren path* scenario and the *structured plant cover*] in which specified attributes are changed in quantity" (Pearce, 2002, p.55).

We did not include directly in each scenario a money value, but we asked respondents to elicit their WTP for each choice according to the given WTP for the baseline scenario. Then, we asked respondents to choose their preferred option and why. Moreover, the attributes maintenance as well as safety and security and their respective levels have not been integrated into the hand-drawings. In order to get the input of the respondents on these aspects, we decided that the first part of the questionnaire should focus on the "Récollets" path. We asked respondents questions about frequency, activity, maintenance and safety and security of the above-named green infrastructure.

For the construction of choices, we differentiate the different choices through the degree of transparency and luminosity for the surrounding vegetation and the structure of green space on the river bank along the path.

2.1.4 Organisation of the survey

We have administered two surveys. When we began the research, it was agreed that we will focus on the population living within 150 m of the river Vesdre (see figure 4, p.14 and figure 11, p.40). Hence, we conducted 87 door-to-door questionnaires in the study area consisting of the following statistical districts "Mamelon Vert", "Prés-Javais", "Quartier Est", "Saint-Remacle". In the course of our research, we saw that we should analyze the project at a bigger scale. By consequent, we implemented a second survey focusing on the population of the urban region (Luyten et al., 2009). The researcher conducted the second survey by stopping people on the street and interviewed 96 people passing by the "Place Verte" (see figure 4, p.14). Few questions have been added to the questionnaire (see questions highlighted in red in appendix 5.3). One picture showing the "Prés-Javais" section for the planned project of the bicycle/pedestrian path represented at a small scale has been added to the visual aids support (see visual aids in appendix 5.4). In this part of the report, we will explain how we have implemented the first survey.

2.1.4.1 The sample

"Choosing the sample size is a balancing of cost versus precision. The sample size is calculated according to three considerations:
(1) the smallest subgroup within the sample for which estimates are needed;
(2) the precision with which estimates are needed – how much sampling error can be tolerated;
(3) how much variation there is in the target population with respect to the characteristic of interest" (Bateman, 2002, p.107).

(1) Our study area for the first survey is small and the analysis of the socio-demographic data (see above 1.2) does not show lots of discrepancies between the residents. By consequent, we haven't subdivided the sample frame population into sub-group.
(2) The margin of error, named accuracy standard error, is a plus-or-minus figure, which represents the amount of error tolerated. The sample size has been estimated for the following figures ±3%, ±5% and 10%. Proportion in true sample means "the proportion of the population who do/do not have the characteristic of interest" (Bateman, 2002, p.109).
(3) We can define the confidence interval as "a range around a measurement that conveys how precise the measurement is" (Department of Health – website, 1999). According to the means available, we chose a 95% confidence level, which means that we can be 95% certain.

The target population is the population living in the study case area compound of Mamelon Vert, Prés-Javais, Quartier Est and Saint-Remacle districts. The sample frame population, from which the sample is coming, consists of all the dwelling units located not far away than 150 meters from the future green infrastructure project. GIS tools have been used to create the 150 meters buffer and obtain the selected dwelling units. The sample is based on the size of the target population, which is compound of 867 habitations counted in the buffer of 150 meters. Then, the sample has been selected from the frame which consisted of computer-generated list of random numbers. A 10% simple random has been done where each variable has "an equal chance of being selected" (Pearce, 2002, p. 44).

Table 18: Choosing the sample size

	95% confidence interval					
Target population	867	867	**867**	867	867	867
Proportion in true sample	0.5	0.5	**0.5**	0.2	0.2	0.2
Accuracy standard error x 2	±3%	±5%	**±10%**	±3%	±5%	±10%
Sample size required	479	267	**87**	383	192	58

Source: SEGEFA-ULg, 2011; Adapted from Bateman, 2002 p.109,
Creative Research System - website, 2010 and Raosoft - website, 2004.

Several constraints should be considered when analyzing the sample design. The constraints are mentioned below.
(1) The number of households located in the 150 m buffer from the river Vesdre for the first survey.
(2) The time and cost for administering both surveys; both surveys have been administered by one researcher of SEGEFA-ULg.
(3) The low response rate for both survey; for the first survey the researcher needed 12 days for administering 87 surveys. In average, 7.25 surveys have been administered per day. The researcher knocked at the door of 60 households for getting 7.25 completed surveys per day. The answer rate is therefore of 12%.
In the second survey, the research needed 11 days for administering 96 surveys. In average, 8.72 surveys have been administered per day. The researcher asked 80 persons in the street per day. The answer rate is therefore of 11%.

The method used was in the first place to inform the habitants of the dwelling units originally selected of the project and questionnaire through a letter placed in their briefcase (see appendix 5.2: Introduction letter) and in the second place to contact them for administering the questionnaire. If they say no, we went back to the sample frame population and asked the following one if they do agree to answer the questionnaire. The answer rate was relatively low (12%), although the answer rate increased when a contact has been made before by phone - 31% when an appointment has been made by phone and 11% when no appointment has been made – it explains why the household effectively surveyed don't match the sample selected. Older people, female and unemployed people were more likely to answer a phone call or to be at home, than younger, worker or male household members. That is why the researcher went three Saturdays out from the eleven days to the area to get the chance to administer the questionnaire to a reasonable number of active people.

The questionnaire is made of 37 questions and it took us 10 minutes to administer it. The questionnaire is structured as follow: introductory questions on the effective use of the "Récollets" path, explanation of the project presenting the contingent valuation and choice modelling question and the use/frequentation of the different green spaces in and outside Verviers.

According to the literature, it is recommended to undertake face-to-face interviews (Pearce, 2002, p.41). Interviews took place one-to-one between the interviewer and the respondent at home. There are lots of advantages of administering face-to-face interviews. This type of questionnaire is highly flexible and allows asking more complex questions, clarifying question meaning when respondents ask for help and using of visual aids. Moreover, the researcher can collect a larger quantity of data. 87 face-to-face questionnaires have been administered over a 5 week period in January/February 2011 at the rate of 2-3 days per week. One researcher administered the questionnaire, which lasted twelve days in total.

The analysis of the socio-economic data of the case study area shows that the area is relatively poor. A face-to-face questionnaire allows asking people from various backgrounds, getting a better representativeness of different categories of the population living in the area and allowing a higher response rate. Once the interview has begun, it is harder for the respondents to stop the interview process before answering all questions. Nevertheless, one of the respondents did not want any more to answer the questionnaire. He/she didn't feel comfortable with the WTP question; of course this questionnaire has not been considered. It happened that people complained that the questionnaire was too long but still went through it in its entirety. Overall, it was sometimes difficult to get people involved, because they either did not have time or they did not want or they did not speak enough French or they were afraid of the questions.

Respondents have been contacted by phone in order to make an appointment for the following days or interviewed from face-to-face without making an appointment if the respondent had time or with appointment if the respondent didn't have time.

Figure 11 illustrates the random selection of the plot located in the study area. Table 19 shows the number of interviews completed by street, and table 20 the survey area and numbers of respondents by street.

Figure 11: Random selection of 10% of the plot located in the study area

Source: SEGEFA-ULg, 2011.

Table 19: Number of interviews achieved by street

Street name	Numbers of interviews completed	Percentage
Sommeleville Bridge	1	1.15%
Courte Street	1	1.15%
Cité Street	1	1.15%
Grandes Rames Street	1	1.15%
Herve Street	2	2.30%
Saint-Remacle Street	2	2.30%
Sainte Anne Street	2	2.30%
Hombiet Street	4	4.60%
Epargne Street	4	4.60%
Prince Street	7	8.05%
Limbourg Street	10	11.49%
Mamelon Vert Street	9	10.34%
Hospices Street	11	12.64%
Raymond Street	14	16.09%
Marie-Henriette Street	18	20.69%
Total	87	100%

Source: SEGEFA-ULg, 2011.

Table 20: The survey area and numbers of respondents

Street name	Number of questionnaires							Description
	Potential respondents pre-contacted by phone				In-home potential respondents contacted			
	A Total number	B Appointment arranged over the phone	C Interviews actually completed	D C/A (%)	E Total number	F Interviews actually completed	G F/E (%)	H Zoning and location
Courte Street	4	2	0	0%	9	1	11%	Dwelling units.
Cité Street	30	0	0	0%	7	1	14%	Dwelling units.
Sommeleville Bridge	7	1	1	14%	7	0	0%	Majority of dwelling units and few businesses.
Grandes Rames Street	14	0	0	0%	4	1	25%	Dwelling units. Few dwellings are located at the bank of the river. The future path will pass along the left bank of the river to the base of the habitations.
Herve Street	7	0	0	0%	11	2	18%	Dwelling units.
Saint-Remacle Street	29	3	1	3%	26	1	4%	Mix of dwelling units and businesses.
Sainte Anne Street	6	0	0	0%	15	2	13%	Mix of dwelling units and businesses.
Hombiet Street	9	1	1	11%	12	3	25%	Dwelling units.
Epargne Street	4	1	1	25%	17	3	18%	Majority of dwelling units and few businesses.
Prince Street	30	3	2	7%	60	5	8%	Majority of dwelling units and few businesses.
Limbourg Street	53	6	3	6%	45	7	16%	Mix of dwelling units, including the Simonis Res., local authority housing, & retail trades and businesses.
Mamelon Vert Street	24	6	5	21%	14	4	29%	Residential area, on the hill, on the upper of the river Vesdre.
Hospices Street	34	7	6	18%	105	5	5%	Dwelling units, including the "Cité des Grandes Rames", which is a local authority housing.
Raymond Street	60	16	6	10%	70	8	11%	Residential area.
Marie-Henriette Street	74	8	5	7%	100	13	13%	Mix of dwelling units and businesses.
Total	385	54	31	8%	502	56	11%	

Source: SEGEFA-ULg, 2011.

The focus group, the stakeholder interviews and the peer review of the questionnaire design showed few possible biases that we needed to handle. Table 21 describes the types of bias recorded and the implemented solutions.

Table 21: Types of bias recorded and solutions implemented

Type of bias	Nature of bias	Effect on WTP	Solutions
Strategic – classic free rider	The respondent believes that the city council will collect the payment of their WTP.	The given WTP is smaller than the true WTP.	We reminded the respondent the objectives of the question and mention that the study undertaking won't lead to the creation of a new local tax.
Starting – point bias	WTP could be anchored to initial stated value given in the question "Would you agree to pay 25 Euros per year (± 2EUR per month) in communal tax for the creation and maintenance of this project?"	The given WTP corresponding to the initial value is different from the true WTP.	Combination of two elicitation formats: single-bounded dichotomous choice and payment card.
Protest response	(1) Refusal to give their WTP; (2) ridiculously higher WTP given; (3) false zero WTP.	(1) No WTP; (2) the given WTP is higher than the true WTP; (3) the given WTP is lower than the true WTP.	(1) Follow-up questions aimed at asking the reasons why the respondent does not want to give their WTP; (2) remove the WTP concerned in particular when WTP exceeds the respondent's income; (3) remove true protest and keep legitimate zero bids.

Source: Adapted from Pearce and Özdemiroglu, 2002, p. 59.

2.1.5 Visual aids

In parallel to the design of the questionnaire, the LEMA (ULg) has turned images into handmade drawings for the Verviers case study. The pictures are provided on an A4 separate sheet. These illustrations are hand drawn sketches that represent three different scenarios for the project along the banks of the river Vesdre (see above 2.2.2). These pictures were drawn from photos taken by Fabian De Smet from the case study area. The same landscape structure has been used for the different drawings and photos in order to limit factors affecting perception (view length, perspectives, season and relative importance of the background…).

The vegetation along the path on the river bank of the *natural plant cover* and *structured vegetal development* scenarios look very much like each other. That is why we added images to the two drawing pictures, to make sure that people are able to differentiate the *natural plant cover* and the more structured cover. For the *natural plant cover*, we used an image from the master plan (see above fig. 5 p.22) and for the *structured vegetal development* an image from the iStockphoto library.

The aims of using drawings and photos were:

- to help interviewer to explain the project to the respondents which consists of the construction of a bicycle/pedestrian path;
- to help respondents to understand the different scenarios that they are being asked to value;
- to seek people's view of the green investment and on the surrounding area.

The picture was used every time that we interviewed people living in the case study area. At this stage, it is important to mention that the investment had not been made when we conducted the interviews. Some of the participants did not recognize where the photographs were taken despite the fact they had visited the sites. This is the reason why we showed a photo of the area to the participants before showing the handmade drawings with images.

2.2 Results and discussion

As we already explained, we present below the results of the first survey done in the study area. Secondly, we will present in a second part the results of the second survey conducted on-street in the «Place Verte». The objective is to be able to compare the results of both surveys in the discussion.

2.2.1 Results of the survey conducted in the study area

2.2.1.1 Respondents' background

Our case study area is the area located within a 150m radius from the river Vesdre and is composed of the following statistical districts: "Mamelon Vert", "Prés-Javais", "Saint-Remacle" and "Quartier Est". In the report, the statistical district means the smallest standard territorial units, for which statistical data are available (see figure 4 above).

2.2.1.1.1 Distribution by gender

Table 22 shows that the majority of the respondents are female. Indeed, 56% of the respondents are women and 44% are men. The questionnaire was mainly administered during weekdays. Obviously, females are more likely to be at home or to answer the phone during weekdays. It explains why there is 8 points difference between the questionnaire data and the official statistics of the study area. In order to be more representative, we undertook interviews on Saturday.

Table 22: Q30: Demographic indicator - Distribution by gender

	Study area		**Verviers**	**Province of Liège**
Indicator	**Respondent's answer to questionnaire (1)**	**Official statistics** *Mamelon Vert + Prés-Javais + Quartier Est Saint-Remacle +* **(2)**	**Official statistics** *Verviers* **(3)**	**Official statistics** *Province of Liège* **(3)**
Percentage of women	56%	48%	52%	51%

Note: (1) Estimates are based on 87 respondents in the study area.
(2) Regrouping data of the three statistical districts composing the study area.
Source: (1) SEGEFA-ULg, 2011; (2) SPF Economie, 2009 and (3) SPF Economie, 2010.

2.2.1.1.2 Distribution by age

As table 23 shows, young people (from 15 to 29 years old) are under-represented, with 16% of the survey sample, compared to 29% of the overall residential population living officially in the four statistical districts. Conversely, people over 60 years old are over-represented, with 33% of the sample, compared to 15% of the overall residential population over 60 years old.

Table 23: Q29: Demographic indicator - Distribution by age

	Study area		Verviers	Province of Liège
Age	**Respondent's answer to questionnaire (1)**	**Official statistics** *Mamelon Vert + Prés-Javais + Quartier Est + Saint-Remacle* **(2)**	**Official statistics** *Verviers* **(3)**	**Official statistics** *Province of Liège* ***(3)***
20-29 years old	16%	15%	26%	13%
30-49 years old	32%	28%	32%	27%
50-59 years old	16%	11%	15%	14%
Over 60 years old	33%	15%	27%	23%
No answer	2%	0%	-	-

Note: (1) Estimates are based on 87 respondents in the study area. For this indicator 2 (2.29%) were 'not stated' (Refused) in the study area. The question used was: May I ask you your year of birth?
(2) Regrouping data of the three statistical districts composing the study area.
Source: (1) SEGEFA-ULg, 2011; (2) SPF Economie, 2009 and (3) SPF Economie, 2010.

2.2.1.1.3 Distribution by profession

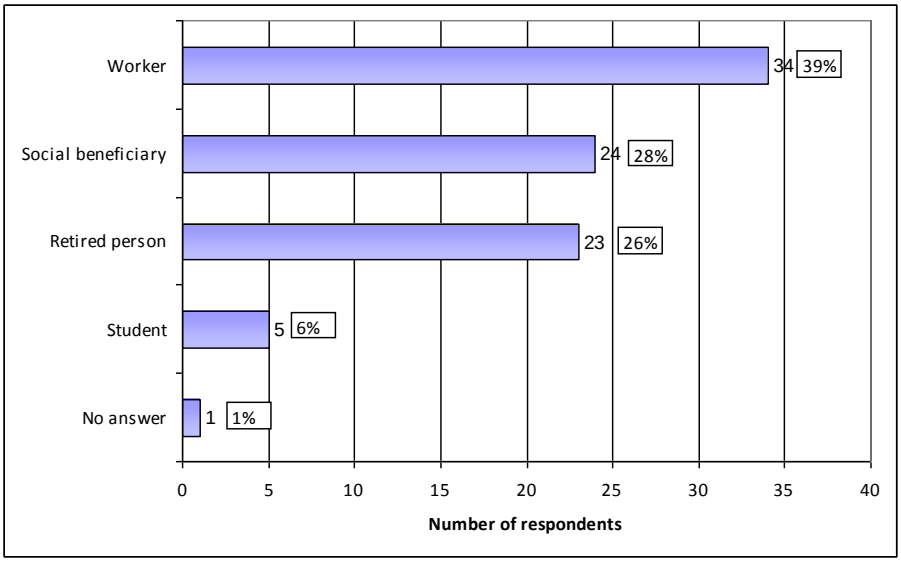
The questionnaire asked the employment status (worker, unemployed, student, and retired person) in order to determine if the sample reflects the characteristics of the population from which it is drawn, i.e. from the study area amalgamation of the four statistical districts. As we can see in figure 12, 39% respondents categorize themselves as workers. 28% are currently social beneficiaries, and 26% describe themselves as retired and 6% as students. Only 1% refuse to answer the question. The unemployment rate is for the survey sample 7 points below the average for the four statistical districts. Table 24 summarizes the unemployment rate at the scale of the study area and the city of Verviers.

Table 24: Economic indicator – Labor market indicator of the study area

	Study area		Verviers	Province of Liège
Indicator	**Respondent's answer to questionnaire (1)**	**Official statistics** *Mamelon Vert + Prés-Javais + Quartier Est + Saint-Remacle* **(2)**	**Official statistics** *Verviers* **(3)**	**Official statistics** *Province of Liège* **(3)**
Unemployment rate	28%	35%	20%	16%

Note: (1) Estimates are based on 69 respondents, aged between 15 and 64 years old, in the study area. The question used for calculating the unemployment rate is: Are you? Student, Worker, Social beneficiary or Retired.
(2) Regrouping data of the three statistical districts composing the study area.
Source: (1) SEGEFA-ULg, 2011; (2) SPF Economie, 2009 and (3) SPF Economie, 2010.

Figure 12: Q31: Number of respondents per employment status category



Source: SEGEFA-ULg, 2011.

As figure 12 shows, we interviewed mostly beneficiaries of social security or retired persons. These people are the most available and the most often at home during working hours.

2.2.1.1.4 Household composition

66 percent of household respondents interviewed are families, i.e. made up of more than 2 people. This is 14 points higher than for the study area (52%). 4-person households are over-represented in the survey sample in comparison to summarized data of the four statistical districts. It can be explained by the fact that one family member of the 4-person households was more often at home, when we surveyed the area, in order to take care of children. Among the 87 respondents, 54 answered that no children under 15 years old are living in the household. For the 31 household remaining respondents, 13 have one child, 17 two children, 1 three children under 15 years old. Table 25 and figure 13 illustrate the results presented above.

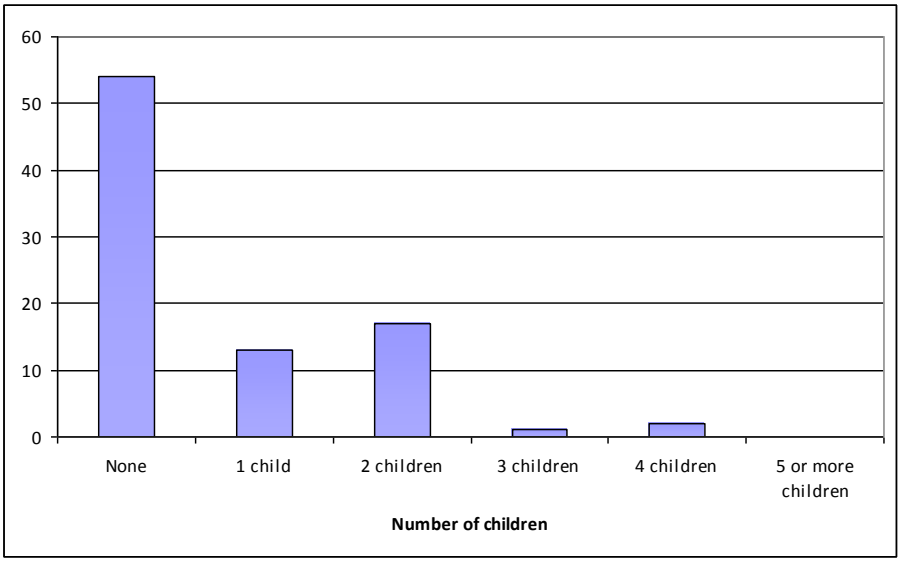
Table 25: Q33: Demographic indicator - Household composition

	Study area		**Verviers**	**Province of Liège**
Indicators	**Household respondent's answer to questionnaire (1)**	**Official statistics** *Mamelon Vert + Prés-Javais + Quartier Est + Saint-Remacle* **(2)**	**Official statistics** *Verviers* **(3)**	**Official statistics** *Province of Liège* **(3)**
Single household rate	33%	48%	43%	38%
Percentage of 2-person households	26%	22%	27%	30%
Percentage of 3-person households	9%	12%	13%	15%
Percentage of 4-or-more-person households	31%	18%	17%	18%

Note: (1) Estimates are based on 87 household respondents in the study area. The question used was: How many people live in your household, including yourself?
(2) Regrouping data of the three statistical districts composing the study area.

Source: (1) SEGEFA-ULg, 2011; (2) SPF Economie, 2009 and (3) SPF Economie, 2010.

Figure 13: Q34: How many children under 15 years old are there in your household?

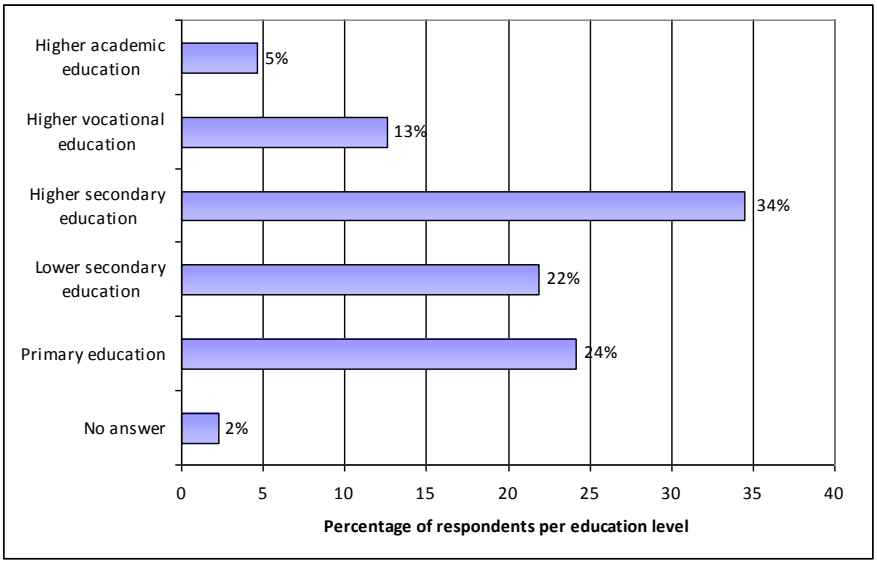


Source: SEGEFA-ULg, 2011.

2.2.1.1.5 Distribution by education level

Among the 87 respondents, 34% said they had undergone a higher secondary education and 24% reported having finished their primary education. Only 17% of the 87 respondents hold either a higher vocational qualification (13%) or a higher academic qualification (5%). Figure 14 illustrates the distribution of respondents per educational level.

Figure 14: Q35: Percentage of respondents per education level



Source: SEGEFA-ULg, 2011.

2.2.1.1.6 Ownership rate and motorization rate

The ownership rate and motorization rate confirm the trend given by the labor market indicator. The ownership rate, which is the ratio between the number of owner-occupied housing unit and the number of household, is 45% for the survey sample. This rate is 4 points below than the ownership

rate of the three statistical districts (49%) and 14 points below than for Verviers. The motorization rate, which can be defined as the ratio between the number of vehicles and the total population, is 60%, i.e. 5 points below than for the three statistical districts (65%) and 16 points below than the Verviers's figure (76%). According to the economic indicators (table 26), the area composed of "Mamelon Vert", "Prés-Javais", "Quartier Est" and "Saint-Remacle" statistical districts is an economically deprived inner-city area, when compared to the economic indicators for the city of Verviers as a whole. For the survey, a representative and randomly selected sample of 87 inhabitants from the four statistical districts was interviewed. Nevertheless, the economic data of the sample show a more deprived population than the population of the four statistical districts and the city of Verviers. It can be explained by the fact that there is a 10 year-time-difference between the data collected from the Belgium National Institute of Statistics for the four statistical districts as well as the city of Verviers and the data collected during the interviews, which have been carried out in 2011.

Table 26: Q35 and Q36: Household and Economic Indicators - Ownership rate and motorization rate

	Study area		Verviers	Province of Liège
Indicators	**Respondent's answer to questionnaire (1)**	**Official statistics** *Mamelon Vert + Prés-Javais + Saint-Remacle + Quartier Est* **(2)**	**Official statistics** *Verviers* **(3)**	**Official statistics** *Province of Liège* **(3)**
Ownership rate	45%	48%	59%	62%
Motorized rate	60%	53%	65%	72%

Note: (1) Estimates are based on 87 respondents in the study area. The question used for calculating the ownership rate was: Are you owner or tenant of your house/flat? The question used for calculating the motorization rate was: How many cars does your household have? (2) Regrouping data of the three statistical districts composing the study area.

Source: (1) SEGEFA-ULg, 2011; (2) SPF Economie, 2009 and (3) SPF Economie, 2010.

2.2.1.1.7 Salary level of the respondents

Table 27 shows that 69% of the respondents answered the question concerning the salary level. The monthly income level of the respondents ranges mostly from 900 EUR to 1500 EUR.

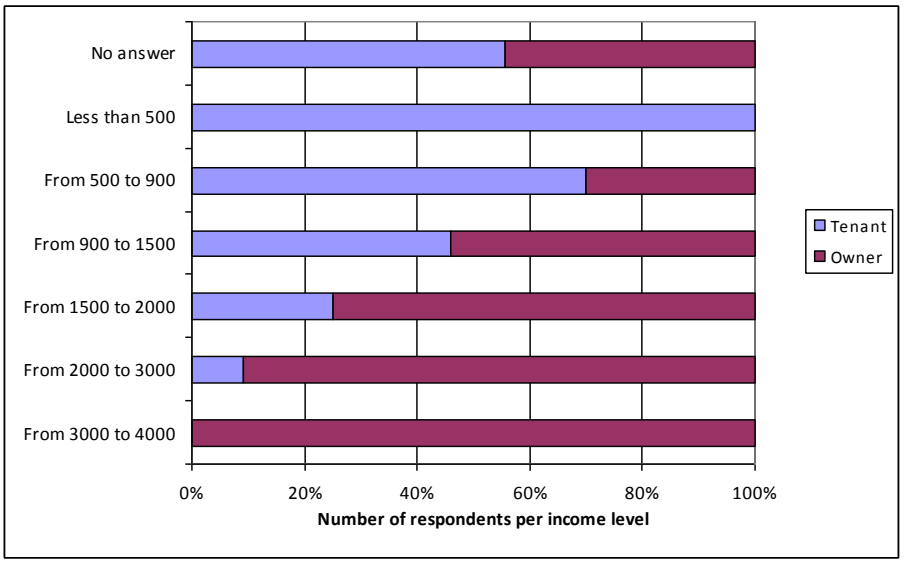
Table 27: Q37: Salary level of the respondents

	Tenant (absolute value)	Tenant (%)	Owner (absolute value)	Owner (%)	Total (absolute value)	Total (%)
Less than 500	2	5	0	0	2	2
From 500 to 900	7	18	3	6	10	11
From 900 to 1500	11	28	13	27	24	28
From 1500 to 2000	3	8	9	19	12	14
From 2000 to 3000	1	3	10	21	11	13
From 3000 to 4000	0	0	1	2	1	1
No answer	15	38	12	25	27	31
Total	**39**		**48**		**87**	

Source: SEGEFA-ULg, 2011.

Figure 15 offers a graphic illustration of the distribution of respondents by income level. The higher the salary is, the higher the probability that the respondent is an owner-occupier.

Figure 15: Q37: Percentage of respondents per income level



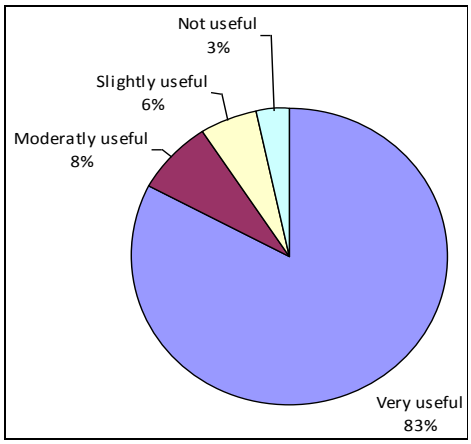
Source: SEGEFA-ULg, 2011.

In conclusion, we can say that the sample of the first survey conducted in the study area is mostly female, old, non-working and living in multi-person household. The population living in one of the four statistical districts is in the majority masculine, young, living alone, non-working and with an immigrant background. In comparison to the analysis done on the social and economic indicators of the four statistical districts composing the study area, we can conclude that our sample is more and less representative of the population living in the study area. We would like here to draw the attention of the reader to the fact that certain segments of the population were easier to interview than others. It could explain the slight difference between the composition of the population living in the study area and respondents of the survey.

2.2.1.2 Visual aids

The LEMA (ULg) has developed drawings for the Verviers case study. These illustrations are hand-drawn sketches that represent three different scenarios for the project of the banks of the river Vesdre. These pictures were presented to respondents in the questionnaire developed for the economic valuation of green infrastructure investments. We added images to two drawings, to make sure that people will be able to differentiate the *natural plant cover* and the more *structured cover*. The aims of using the drawings and photos were: firstly to help the interviewer to explain the project to the respondents which consists of the construction of a bicycle/pedestrian path, secondly to help the respondents to understand the different scenarios that they are being asked to value and thirdly to seek people's view of the green investment and on the area around there. In the questionnaire, after the valuation question, we asked the respondents "How useful were the visual aids to your understanding of the different options?" As the figure 16 shows, the majority of the respondents found the static pictures very useful for understanding the project and answering the questions asked by the interviewer.

Figure 16: Q19: How useful were the visual aids to your understanding of the different options?



Source: SEGEFA-ULg, 2010.

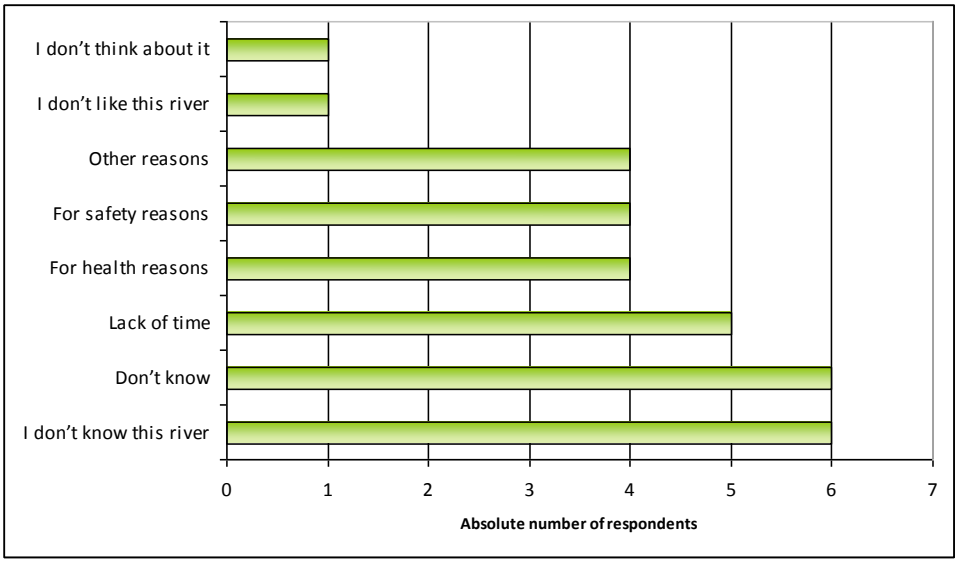
2.2.1.3 The "Récollets" path

By answering the question "Do you occasionally use the "Récollets" path?" 36% (or 31 respondents) of the surveyed population stated that they do not go to the "Récollets" path. 64% (or 56 respondents) of the population stated that they go to the "Récollets" path, of which 31% (or 27 respondents) affirmed going there rarely and 33% (or 29 respondents) going there often or very often.

As figure 17 shown, the main reasons for which the respondents do not go there are mainly: “I don’t know this river” (19%), “Lack of time” (16%), “For health reasons” (13%), “For safety reasons” (13%), “Other reasons” (13%). Other reasons mentioned are:

- there is nothing to see;
- I am already going to the Park Marie-Henriette;
- I am not going this way;
- I am not interested in it.

Figure 17: For which reasons do you not go there?



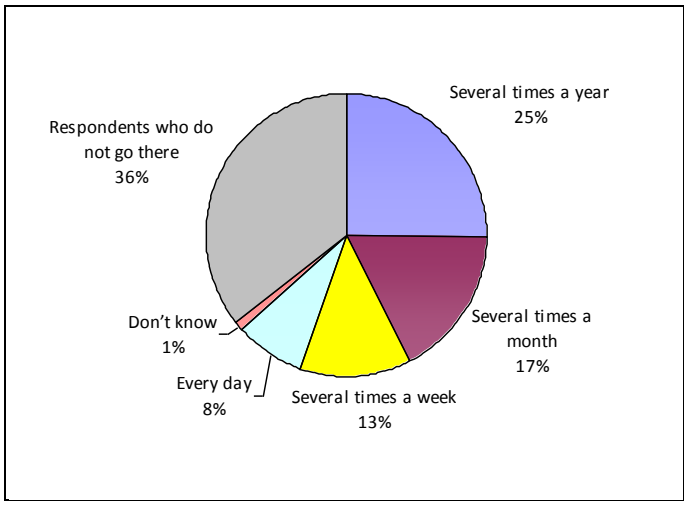
Source: SEGEFA-ULg, 2011.

2.2.1.3.1 Frequency of visits to the path

Amongst the 56 respondents who said that they go to the "Récollets" path, 39% stated visiting the path "several times a year". A third (33%) replied visiting the "Récollets" path more frequently, reporting either "every day" or "several times a week". If we take into account the respondents who stated not going to the "Récollets" path, 25% visited the park "several times a year" and 21% "every day" or "several times a week". The Figure 18 shows the share of each statement for the respondents going to the "Récollets" path (fig. 18.1) and going or not to the "Récollets" path (fig. 18.2).

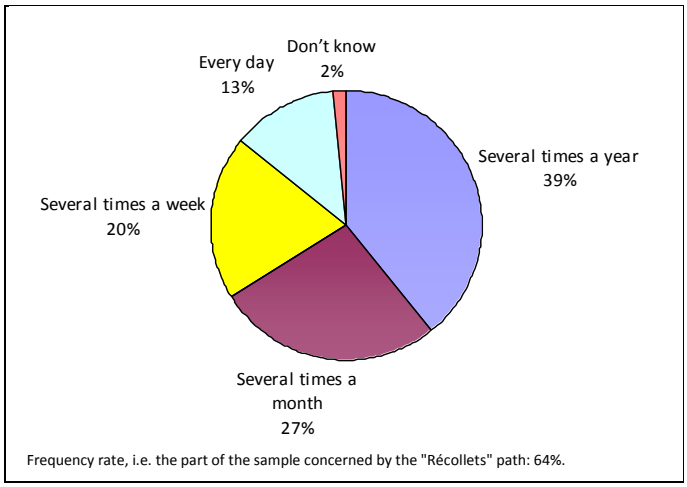
Figure 18: How often do you use the "Récollets" path?

Fig. 18.1: Whole sample



Source: SEGEFA-ULg, 2011.

Fig. 18.2: Respondents going to the "Récollets" path

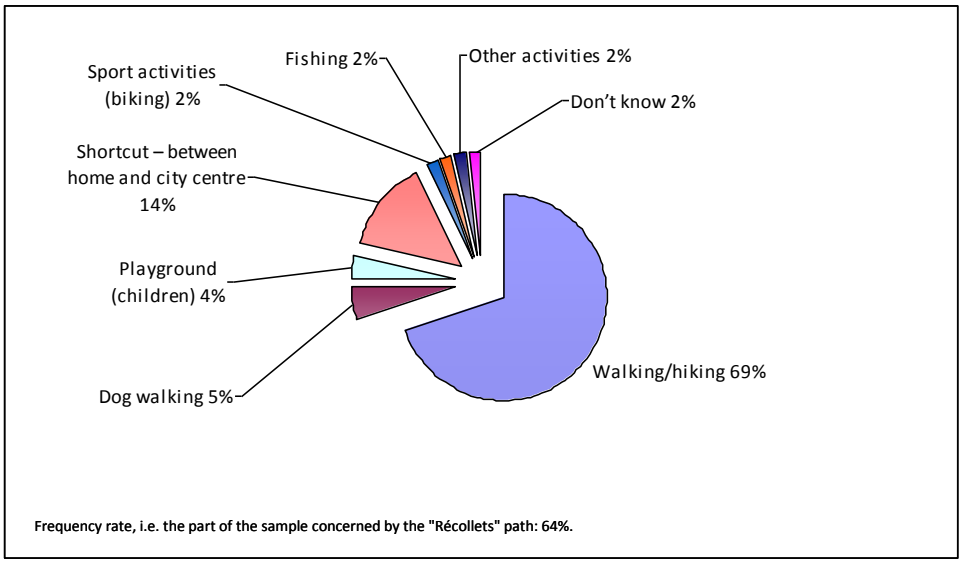


Source: SEGEFA-ULg, 2011.

2.2.1.3.2 Activity

A large majority (70%) goes to the "Récollets" path for walking and/or hiking. Only 14% use the path as shortcut between their home and the city centre. The next activities are dog walking (5%) and playground (4%). Shares for other activities are smaller, as illustrated in figure 19.

Figure 19: The last time you used the "Récollets" path, what was the main activity you carried out?

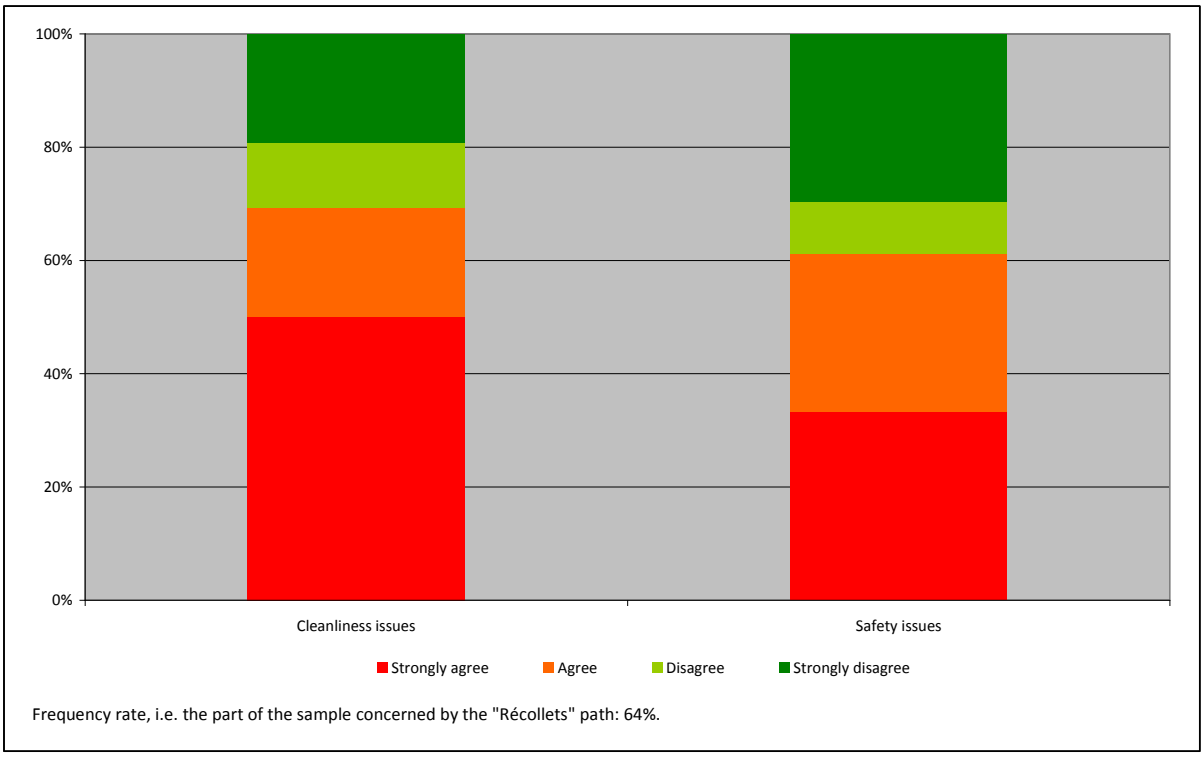


Source: SEGEFA-ULg, 2011.

2.2.1.3.3 Cleanliness and safety

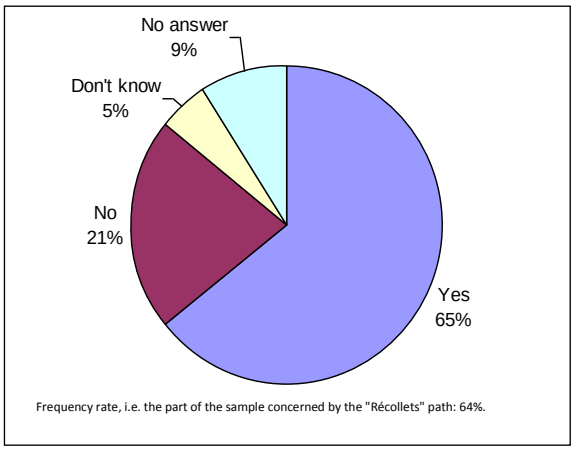
Amongst the group of 56 respondents, 64% (or 36 respondents) agreed or strongly agreed that there are cleanliness problems on the “Récollets” path and 58% (or 31 respondents) that there are safety problems. Figure 20 shows the proportion of respondents agreeing (or disagreeing) with the fact that there are cleanliness and safety problems. Figure 21 and 22 illustrate the need (or not) of additional means/resources to ensure the cleanliness/safety of the “Récollets” path.

Figure 20: In your opinion, are there cleanliness or safety problems on the “Récollets” path?



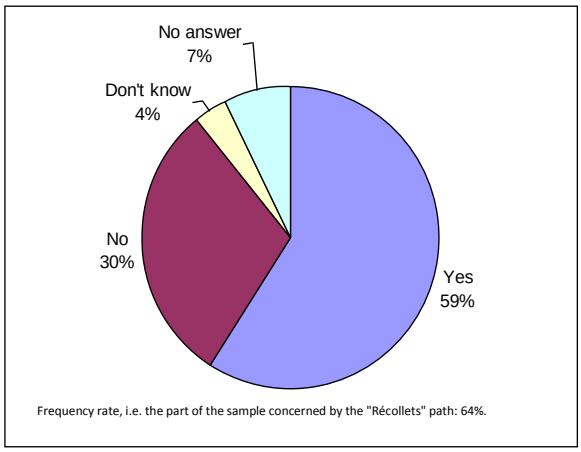
Source: SEGEFA-ULg, 2011.

Figure 21: In your opinion, should additional means/resources be devoted to ensure the cleanliness of the "Récollets" path?



Source: SEGEFA-ULg, 2011.

Figure 22: In your opinion, should additional means/resources be devoted to ensure the safety of the "Récollets" path?



Source: SEGEFA-ULg, 2011.

65% (or 36 respondents) replied that additional resources are necessary to guarantee the cleanliness of the path and 59% (or 33 respondents) reported the same comment about the safety of the path.

The resources suggested by respondents for improving the cleanliness of the path can be divided in three categories, namely safety, cleanliness and educational measures:

Safety measures:

- hidden video surveillance;
- more lighting and surveillance;
- police or safety officers patrolling more often – foot or bike patrol;
- prevention – Control and punishment for littering, i.e. throwing trash on the ground;
- barriers along the river Vesdre;
- enlarging the path allowing people to pass each other.

Cleanliness measures:

- people collecting the bins more regularly;
- more unbreakable bins and disposals of pet excrement;
- city services to clean up the street;
- pruning and control of dangerous plants.

Educational measures:

- work of general interest for people making the path dirty;
- fining people making the place dirty;
- speaking to people;
- better education.

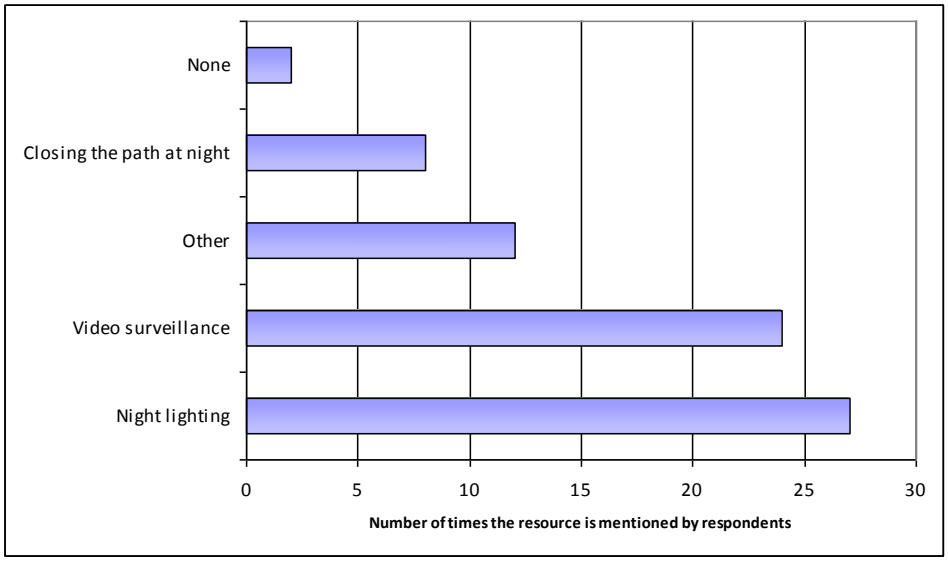
Other requests:

- more childrens' playgrounds;
- more polite behavior (alcoholics and drug addicts do not respect the place);
- people receiving income assistance or unemployed people could participate in work of general interest;
- public policy should better serve the people.

Figure 23 examines the resources requested by the respondents for improving the safety of the path. According to the respondents, night lighting (mentioned 27 times) and video surveillance (mentioned 20 times) are the main actions that could improve the safety of the path. The other measures that were mentioned are:

- day lighting and safety officer patrols;
- barriers / balustrade for children along the river Vesdre;
- protection of the site and pruning of trees;
- developing prevention measures;
- removing the bumps in the path.

Figure 23: Additional resources related to the safety of the path



Source: SEGEFA-ULg, 2011.

2.2.1.4 The Contingent Valuation Method

This part of the report is dealing with the analysis of the results of the Contingent Valuation Method. This relates to the following question: "Would you agree to pay 25 Euros per year (± 2 Euros per month) in communal tax for the creation and maintenance of this project?" According to Pearce and Özdemiroglu (2002, p.13), "the analysis stage should estimate the mean and median willingness to pay (or accept) of respondents; determine the extent to which differences in responses can be explained by respondents' characteristics and provide a transfer equation for use in future benefits transfer exercises. The end results of the analysis stage are estimates of welfare changes from the

proposed scenarios". In addition to the Economic Valuation with Stated Preference Techniques Summary Guide written by Pearce and Özdemiroglu (2002), we analysed the data with the help of the Manual on Economic valuation with Stated Preference Techniques written by Bateman et al. (2002).

2.2.1.4.1 Identifying non-valid responses

The negative answers are categorized as zero valuation if the respondents are not able or not willing to pay anything and as a protest bid if the respondents have difficulties evaluating the good in monetary terms or disapprove the concept. The questionnaire proposed follow-up questions in order to identify non-valid responses and for what reasons, as detailed in table 28.

Table 28: Answers to the follow-up questions asking why the respondent gives a zero WTP

For which reasons do you not wish to pay?	
I shouldn't be the one paying	5
The district should be the one paying	6
It is not necessary to modifiy the state of this river	
My financial means won't allow me to pay	9
I don't have enough information on which to base a decision	
I am afraid of paying for others	
It would prevent me from taking part in my activities	
I already pay to take part in a leisure activity	
I don't want the river to be modified	
I don't feel concerned	
Other reasons	21
(Don't know)*	*(1)**
Total	*41*

* Values excluded from the analysis

Source: SEGEFA-ULg, 2010.

41 respondents out of 87 gave a zero WTP. The analysis of the follow-up questions shows that around ¼ of the respondents given a zero WTP recognize not having sufficient financial means to pay the new local tax aiming to maintaining the green infrastructure. Around 1/8 of respondents given a zero WTP think it is not up to them to pay for the maintenance of the site and around 1/8 think it is up to the city council to pay for the maintenance.

51% of respondents given a zero WTP gave reason different to the previously mentioned reasons. The other reasons mentioned are:

- For 67% (i.e 14 out of 21 respondents) of respondents choosing "Other reasons", the reason mentioned is that they pay enough taxes and hence they were not willing to pay anymore. Some of them formulated the same comments in different ways:

- one said that she/he already paid lots of taxes and not a lot of things are improving;
- another one said that according to the level of taxes paid, the city council doesn't provide the expected results;
- another respondent mentioned that the path should belong to everyone because it is the public domain;
- one respondent said that he paid enough taxes and that there are other more useful things to improve;
- the taxes are too high.

The other reasons were:

- the maintenance of the Marie-Louise park is disastrous;
- the project is not located in the most convenient place - something should have been done in the centre of Verviers.

As we explained in the Point 2.1, the responses that cannot be treated as valid reflections of respondents' WTP should be removed. First of all, no respondent refused to answer the valuation question. This is a good thing; it means that they feel concerned with the green infrastructure project.

A table with the amount per year (from €0 to €200) and corresponding values per month (from €0 to €16.66) was shown to people in order to help them to elicit their WTP and to represent themselves the value they will contribute per month to the maintenance of the green infrastructure. Nevertheless, 3 respondents gave invalid answers:

- one respondent said that he/she didn't know which amount he/she can afford to pay;
- two respondents gave unrealistic values : one gave a value too high according to his income (WTP: €70 per year / Income : less than €500 per month) and the other one gave the maximum amount proposed; this respondent was willing to pay €200 for a whole package, notably providing a barbecue area and free barbecue facilities, more playschool for children and to convert the streets surroundings the "Grandes Rames" social housing into a pedestrian area in order to have a safe area for the children to play.

41 out of 87 respondents who do not provide their WTP (answer = 0), gave a motivated reason of their refusal to pay (see above). Consequently, we decided to keep for the analysis the respondents who provided a zero for their WTP and to remove from the analysis the three previous respondents described before.

2.2.1.4.2 Reliability and validity of the results.

Firstly, we analyzed the reliability and validity of the data. ***Reliability*** means "the degree of replicability of a measurement. That is, can a survey instrument be relied upon to provide the same values if we were to administer it repeatedly under controlled conditions" (Pearce 2002, p.78). ***Validity*** "refers to the degree to which a study succeeds in measuring the intended quantity. That is, to what extend has the survey instrument overcome issues of bias and the hypothetical nature of the exercise to arrive at respondents' actual values" (Pearce 2002, p.78-79). The objective is to determine whether the stated preference questionnaire asked "the right questions in a clear, understandable and appropriate manner, which is termed content (or face) validity" (Pearce 2002, p.79) and/or whether "the values produced by the stated preference study follow the patterns we

expect (e.g. WTP increases with household income, if everything else remains the same) and are in accordance with values derived from other studies, which is termed construct validity" (Pearce 2002, p.79). In order to proceed with the analysis of the data validity, we pre-tested the questionnaire with SEGEFA's employees and over one day in the study area. The test allowed us to make sure that the description of the contingent valuation question and choice modelling scenarios were clear, understandable and asked in an appropriate way. We asked people to motivate their WTP in order to make sure that it was not a protest bid or other non-valid responses (see above 2.1.2).

2.2.1.4.3 The sample mean WTP and the sample median WTP

The mean is "the indicator allowing to summarize information provided by a set of statistical data: it is equal to the sum of these data divided by their number" (INSEE 2011)[9].The arithmetical mean of the sample is €14.46. The mean is not always the best indicator; the median can be more relevant because "if a distribution is sequenced, the median is the value which splits this distribution into two equal parts" (INSEE, 2012)[10]. Table 29 shows the distribution of the respondents between the different WTP values for the contingent valuation question.

Table 29: Distribution of the respondents between the different WTP values for the Contingent valuation question – "Natural plant cover"[11]

*(200)**	*(1)**
150	
100	1
80	
*(70)**	*(1)**
60	1
50	3
40	
35	1
30	2
25	32
20	
15	1
10	2
5	
0	41
*(NSP)**	*(1)**
Total	*84*

* Values excluded from the analysis

Source: SEGEFA-ULg, 2010.

[9] Extracted from http://www.insee.fr/en/methodes/default.asp?page=definitions/moyenne.htm on 08/09/2011.

[10] Extracted from http://www.insee.fr/en/methodes/default.asp?page=definitions/moyenne.htm on 08/09/2011.

[11] We have removed numbers which seemed not to be reliable values. Indeed, the person who proposed a 70 EUR WTP was an 80 year-old person man with no income. Everyone could see that this person had lost sense of reality. A second person proposed a 200 EUR for a whole package of services such as bank, barbecue area, picnic tables, playground equipments and converting the street in front of her apartment to pedestrian only use for children to play. However, we were asking their WTP only for the cycling and walking path along the river Vesdre. It is the reasons which motive the removing of both responses.

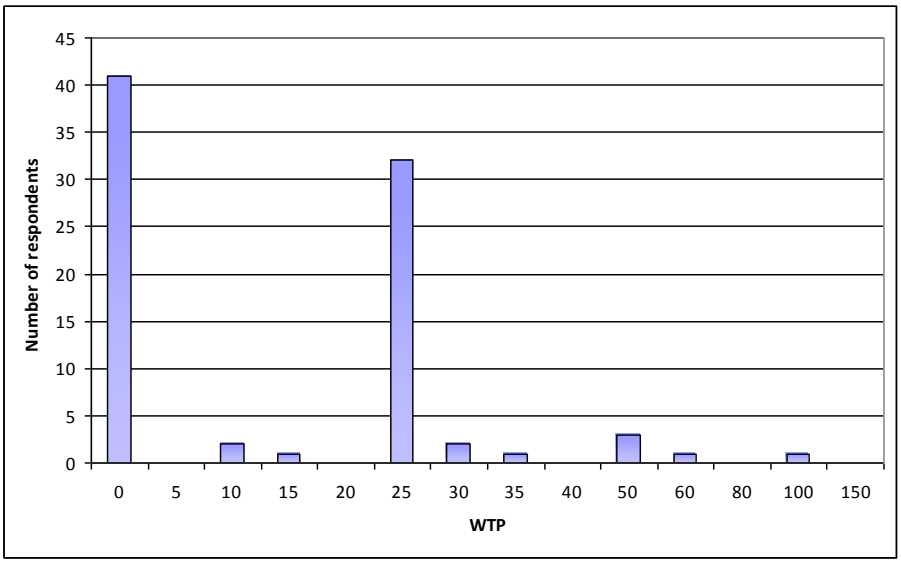
Table 30 reports the statistical analysis of the WTP for the contingent valuation question and figure 24 represents the distribution of the respondents graphically.

Table 30: Statistical analysis – Contingent valuation question – "Natural plant cover"

	N	Min	Max	Sum	Mean	Median	Standard Deviation	Variance
Natural plant cover - with the values 0	84	0	100	1,240	14.76	10	17.78	316.21
Natural plant cover - without the values 0	43	10	100	1,240	28.84	25	14.47	209.33

Source: SEGEFA-ULg, 2010.

Figure 24: Distribution of the respondents between the different WTP values



Source: SEGEFA-ULg, 2010.

The distribution of values is asymmetrical as the figure 24 shows. The values are concentrated at the values 0 and 25. The table 30 and figure 24 described the results of the data analysis. The statistical figures show the importance of the value 0 in the sample and its impacts on the mean and median. If we take into account the value 0, the population of the sample is willing to pay in average € 14.76. The median is 10, it means that at least 50% of the population of the sample is willing to pay less than € 10.

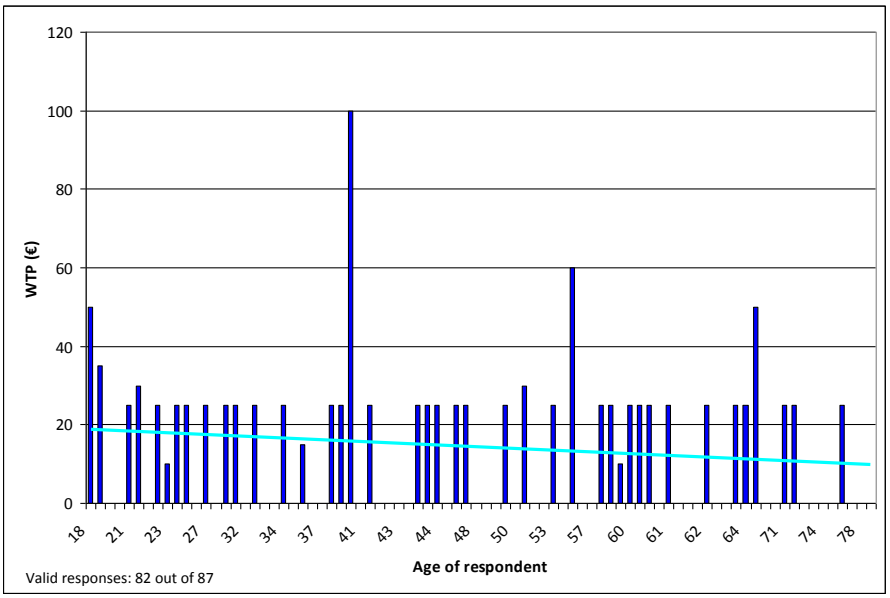
In the first instance, we proceed with the chi-square test in order to determine if there is any correlation between the respondent's answer to the question "Overall, would you be very favorable, rather favorable, rather unfavorable or very unfavorable to this landscaping project?" and their socio-economic data such as gender, occupation, level of education, income. The chi-square shows that there is a correlation between the WTP and the level of education.

In the second instance, we compiled the quantitative answers to the WTP question. The WTP question is: "Would you agree to pay 25 Euros per year (± 2 Euros per month) in communal tax for the creation and maintenance of this project?" Two sub-questions were asked in order to fine-tune the "willingness to pay" of the respondents. One of the questions was for respondents willing to pay 25 EUR. "In this table, up to which amount would you be willing to pay per year in communal tax for

the creation and maintenance of this project?" The other one was for respondents not willing to pay 25 EUR. "In this table, which amount would you be willing to pay per year in communal tax for the creation and maintenance of this project?" Finally, we drew comparisons between the respondent's WTP and their socio-demographic characteristics and their use of the "Récollets" path.

The figure 25 deals with the willingness to pay according to respondents' age. The curve showing the tendency decreases when the age of the respondent increases. Although the trend is negative, it is not statistically significant.

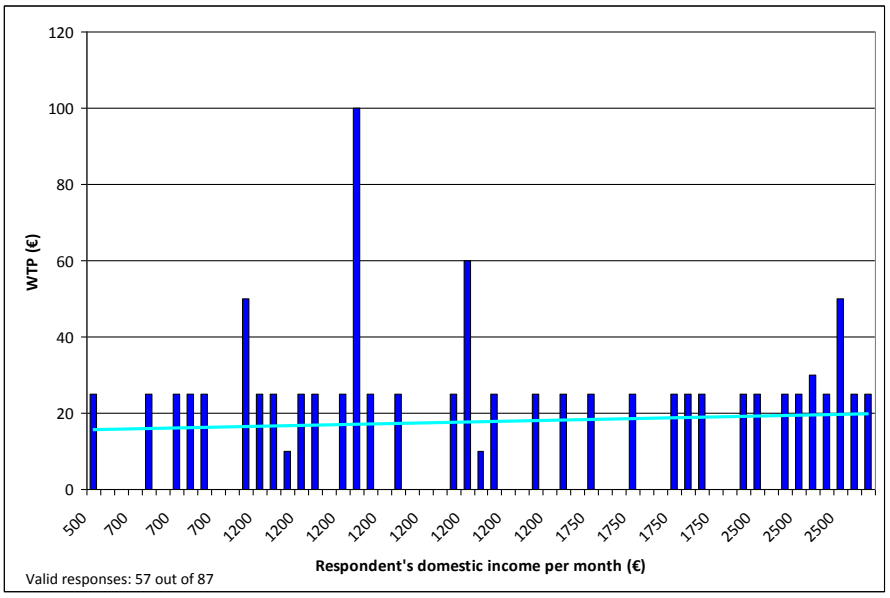
Figure 25: WTP according to respondent's age



Source: SEGEFA-ULg, 2011.

The figure 26, which shows the willingness to pay according to the domestic income of the respondent, does not show any clear correlation between the two variables.

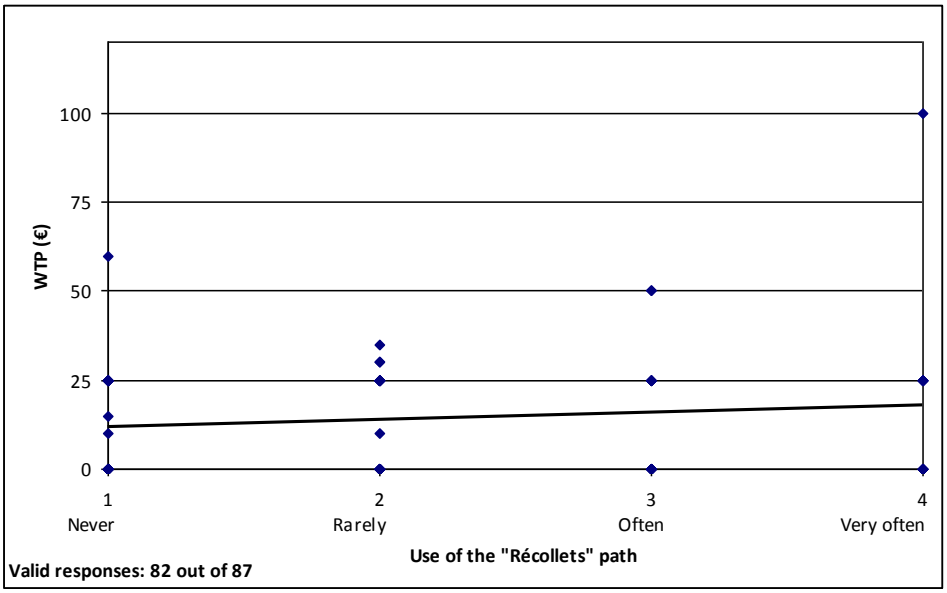
Figure 26: WTP according to respondent's domestic income per month



Source: SEGEFA-ULg, 2011.

The figure 27 deals with the WTP according to the use of the "Récollets" path. It reveals that the correlation is not significant.

Figure 27: WTP according to the use of the "Récollets" path



	Never	*Rarely*	*Often*	*Very often*
100				1
80				
70				
60	1			
50		2		
40				
35	1			
30	1	1		
25	12	8	5	6
20				
15			1	
13				
10	2			
5				
0	12	13	9	7
Total	29	24	15	14
Mean WTP	**15.34**	**13.75**	**9.33**	**17.86**

Source: SEGEFA-ULg, 2011.

2.2.1.5 The Choice Modelling Method

As previously for the contingent valuation, we used the Economic Valuation with Stated Preference Techniques Summary Guide and Manual to help us for the data analysis. The Choice Modelling Method implies that respondents will have to choose between different scenarios. As mentioned in subsection 2.2.2, the three proposed scenarios are made of the same attributes. However, a different level is allocated to each of them.

2.2.1.5.1 Identifying non-valid responses

As explained for the Contingent Valuation Method, the objective is to identify and put aside the zero valuation or protest bid.

For the *barren path* scenario (table 21), 4 respondents gave invalid responses:

- one respondent gave the maximum amount proposed in exchange of getting a whole package of facilities in the Prés-Javais area; it does not correspond to the objective of the green infrastructure planned for the area;
- three respondents did not know what amount they would pay for this scenario.

For the *structured plant cover* (table 23), 3 respondents gave invalid responses:

- one respondent gave the maximum amount proposed in exchange of getting a whole package of facilities in the Prés-Javais area; it does not correspond to the objective of the green infrastructure planned for the area;
- one respondent did not know what amount they would pay;
- one respondent proposed a WTP higher than his ability to pay in relation to his revenue.

2.2.1.5.2 The sample mean WTP and the sample median WTP

Tables 31 and 32 report the statistical analysis of the WTP for the *barren path* scenario. It shows that people were less willing to pay for this scenario than for the *natural plant cover* scenario. The average WTP for this scenario without the values 0 turned out to be €28.53 per year and with the values 0 €4.13 per year. Only 12 people gave a WTP higher than 0 instead of 43 for the *natural plant cover*.

Table 31: Distribution of the respondents between the different WTP values for Choice modelling scenario – "Barren path scenario"

*(200)**	*(1)**
150	
100	
80	
70	
60	
50	2
40	
35	1
30	
25	7
20	1
15	
13	1
10	
5	
0	71
*(NSP)**	*(3)**
Total	*83*

* Values excluded from the analysis

Source: SEGEFA-ULg, 2011.

Table 32: Statistical analysis – Choice modelling question – "Barren path scenario" and "Natural plant cover"

	N	Min	Max	Sum	Mean	Median	Standard Deviation	Variance
Barren path scenario - with the values 0	83	13	100	343	4.13	0	10.93	119.41
Barren path scenario - without the values 0	12	0	100	343	28.58	25	10.49	110
Natural plant cover - with the values 0	84	0	100	1,240	14.76	10	17.78	316.21
Natural plant cover - without the values 0	43	10	100	1,240	28.84	25	14.47	209.33

Source: SEGEFA-ULg, 2011.

Tables 33 and 34 show the statistical analysis of the WTP given by the respondents for the *structured plant cover*. Respondents are more willing to pay for this scenario than for the *barren path* scenario and less willing than for the *natural plant cover*. The median WTP for this scenario without the values 0 turned out to be €30.89 (€28.84 for the *natural plant cover*) and with the values 0 €10.30 (€14.76 for the *natural plant cover*). 28 people gave their WTP instead of 43 for the *natural plant cover*. Fewer people were willing to pay for the *structured plant cover* but the WTP per respondent was higher. The above results seem counterintuitive. In fact, it shows that the respondents are aware of the difficulties.

Table 33: Distribution of the respondents between the different WTP values for Choice modelling scenario – "Structured plant cover"

*(200)**	*(1)**
150	
100	
80	
*(70)**	*(1)**
60	1
50	4
40	
35	2
30	2
25	19
20	
15	
10	
5	
0	56
*(NSP)**	*(1)**
Total	*84*

* Values excluded from the analysis

Source: SEGEFA-ULg, 2011.

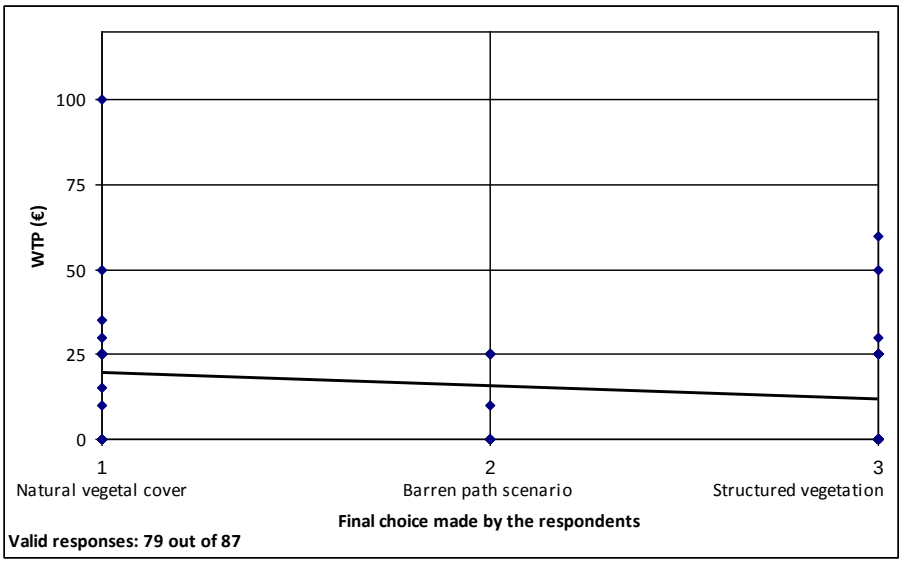
Table 34: Statistical analysis – Choice modelling question – "Structured plant cover", "Barren path scenario" and "Natural plant cover"

	N	Min	Max	Sum	Mean	Median	Standard Deviation	Variance
Structured plant cover - with the values 0	84	0	100	865	10.30	0	15.84	250.81
Structured plant cover - without the values 0	28	25	100	865	30.89	25	10.55	111.21
Barren path scenario - with the values 0	83	13	100	343	4.13	0	10.93	119.41
Barren path scenario - without the values 0	12	0	100	343	28.58	25	10.49	110
Natural plant cover - with the values 0	84	0	100	1,240	14.76	10	17.78	316.21
Natural plant cover - without the values 0	43	10	100	1,240	28.84	25	14.47	209.33

Source: SEGEFA-ULg, 2011.

Figure 28 shows the willingness to pay for the *natural plant cover* according to the final choice made by the respondents.

Figure 28: WTP for the natural plant cover according to the final choice made by the respondents.



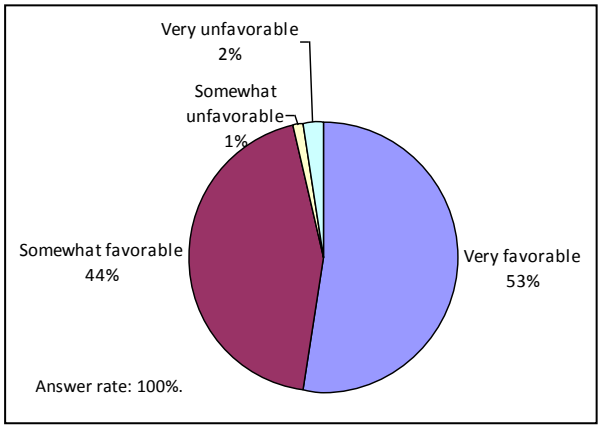
	Natural plant cover	Barren path scenario	Structured vegetation
100	1		
80			
70			
60			1
50	1		1
40			
35	1		
30	1		1
25	11	5	15
20			
15	1		
10	1	1	
5			
0	8	6	24
Total	25	12	42
Mean WTP	**20.60**	**11.25**	**12.26**

Source: SEGEFA-ULg, 2011

Figures 29, 30 and 31 show that respondents are 97% “very” or “somewhat favorable” about the natural plant cover scenario. The figures indicate also that respondents are at 65% “very” or “somewhat favorable” about the structured plant cover but only at 32% about the barren path scenario.

Figure 29: Natural plant cover

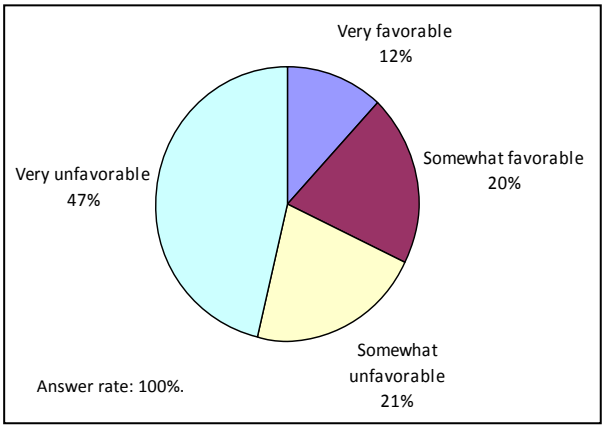
Q11: Are you very favorable, somewhat favorable, somewhat unfavorable or very unfavorable about this planning project?



Source: SEGEFA-ULg, 2010.

Figure 30: Barren path

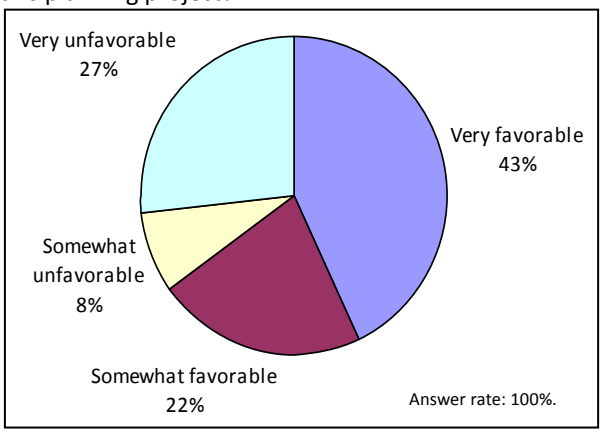
Are you very favorable, somewhat favorable, somewhat unfavorable or very unfavorable about this planning project?



Source: SEGEFA-ULg, 2010.

Figure 31: Structured vegetation

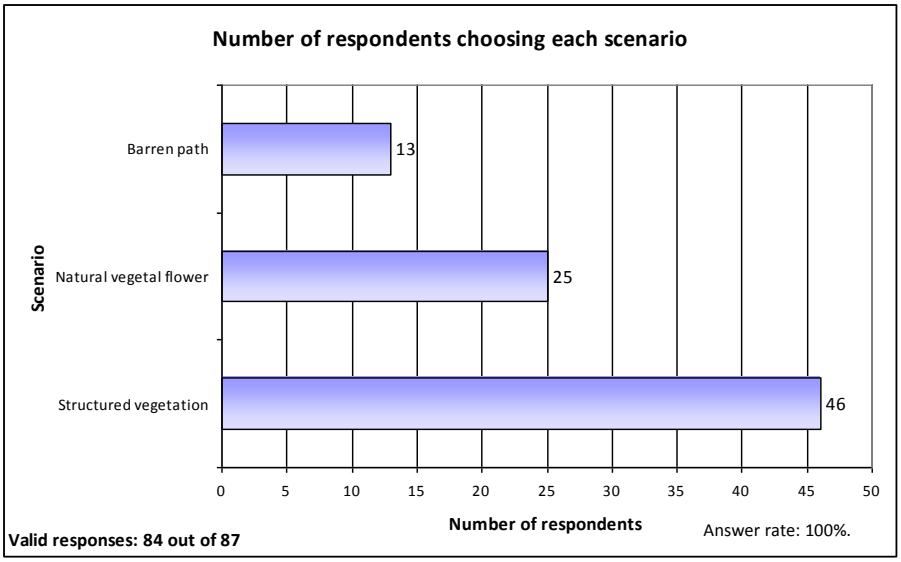
Are you very favorable, somewhat favorable, somewhat unfavorable or very unfavorable about this planning project?



Source: SEGEFA-ULg, 2011.

Figure 32 represents the results of the following question: “Among the three scenarios, which do you prefer?” We can see that the structured vegetation scenario is more attractive to respondents than the natural vegetation. The differences between the two are that the number of respondents willing to pay is lower for the structured vegetation scenario than for the natural plant cover but their WTP are higher.

Figure 32: Number of respondents choosing each green infrastructure scenario



Source: SEGEFA-ULg, 2010.

We asked people to motivate their decision through an open question. Below some representative quotes or adjectives are used to explain why the respondents choose this specific scenario from the set of alternative scenarios.

2.2.1.5.3 Why did you choose this option?

Figure 33: Original quotations for structured vegetation scenario

Source: SEGEFA-ULg, 2011.

Figure 33bis: Translated quotations for structured vegetation scenario

Source: SEGEFA-ULg, 2011.

Figure 34: Original quotations for barren path scenario

"Durabilité dans le temps; bien vieillir; aspect pratique pour les vélos."

"C'est plus facile de nettoyer les crasses sur le gravier que dans la végétation."

"Les deux autres options pourraient apporter de l'humidité."

"Préfère le couvert végétal naturel mais peur que les jeunes saccagent le site."

"Les déchets seront plus visibles donc les gens se sentiront forcés de ramasser."

"Risque d'inondation et de dégradation avec la montée des eaux et la présence constante de dépotoirs."

"C'est déjà joli; c'est pour des raisons de propreté et d'entretien."

"Nécessité d'entretien minimum; moins vite dégradable."

"Les enfants peuvent s'asseoir."

Source: SEGEFA-ULg, 2011.

Figure 34bis: Translated quotations for barren path scenario

"Sustainability over time; good ageing; more convenient for biking."

"It is easier to collect the trash on the gravel than in the vegetation."

"The two other options could bring humidity."

"Prefer the natural vegetal cover but afraid that young people could devastate the site."

"The trash will be more visible and people will feel forced to collect it."

"Risks of flooding and deterioration due to rising water, constant garbage dumps."

"It is already nice; it is for maintenance and cleanliness reasons."

"Low maintenance necessity; less possible damages."

"Children can sit down."

Source: SEGEFA-ULg, 2011.

Figure 35: Original quotations for natural plant cover

"Mieux adapté au quartier."

"Les fleurs vont mieux avec la rivière."

"Peur que les fleurs ne durent pas dans le quartier, car mauvaise réputation du quartier."

"Pour l'aménagement floral, le budget doit être plus important et cela ne va pas durer."

"La végétation naturelle permet la création d'un écosystème."

"Chemin plus agréable pour marcher."

"Il y a suffisamment de végétation."

"C'est plus lumineux que les cailloux et les fleurs ne seront pas ceuillies."

"Aménagement minéral – problème d'écoulement."

"Préfère quand c'est plus sauvage , respect de la nature régionale. C'est moins coûteux. Une mauvaise herbe n'existe pas."

"C'est plus naturel; les chiens ne vont pas respecter les fleurs; coût trop important du fait de l'entretien."

"C'est plus naturel et c'est mieux car les fleurs ont besoin d'entretien."

"C'est la plus belle et la plus naturelle."

"C'est plus naturel; demande moins d'entretien; paiement minimum."

Source: SEGEFA-ULg, 2011.

Figure 35bis: Translated quotations for natural plant cover

"Better adapted to the district."

"The river looks better with the flowers."

"Afraid that the flowers don't last in the district, because of the bad reputation of the district."

"For the structured vegetation development, the budget needed will be higher and it won't last."

"Natural vegetation allowed the creation of an ecosystem."

"Path more pleasant to walk in."

"There is enough vegetation."

"It is brighter than the stones and the flowers will not be collected."

"Barren path –water flow problem."

"Prefer the wilder option, more consistent with regional vegetation. It is less expensive. A weed doesn't exist."

"It is more natural; dogs will not respect the flowers; cost too high because of the maintenance."

"It is more natural and it is better because flowers need maintenance."

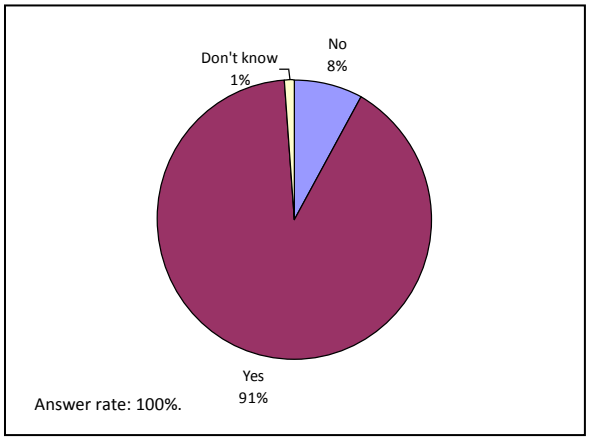
"The nicest and the most natural."

"It is more natural; less maintenance needed; minimal payment."

Source: SEGEFA-ULg, 2011.

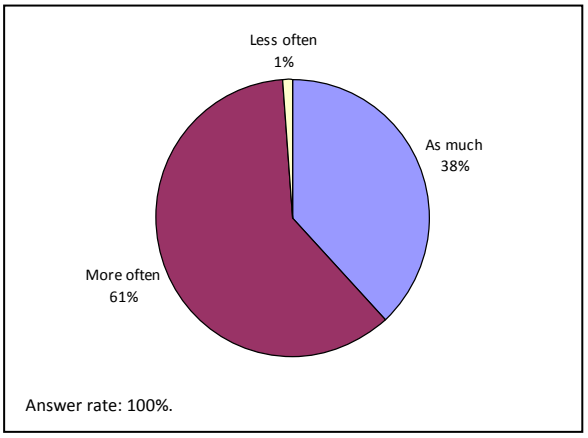
Figures 36 and 37 illustrate the frequency of visits to the landscaping project. This question was asked twice, once at the beginning of the questionnaire after having described the project but before asking the respondent's WTP (fig. 41), and another time in the middle of the questionnaire after having asked the choice modelling questions (fig. 42). The first question shows that if the landscaping project is carried out, it will encourage the respondents to visit the site. 91% answered "yes" to the question. After the contingent valuation question, the question has been worded differently. We asked respondents if the bicycle and pedestrian path at the bank of the river Vesdre was created, would they go along the river Vesdre more often, as often or less often. 61% of respondents claim that if the bicyle and pedestrian path at the bank of the river Vesdre was created, they would go along the river Vesdre more often. Nevertheless, 38% said "as much". It means that whatever happens they might not change their habits.

Figure 36: Q12: If this landscaping project was carried out, would it encourage you to visit the site?



Source: SEGEFA-ULg, 2011.

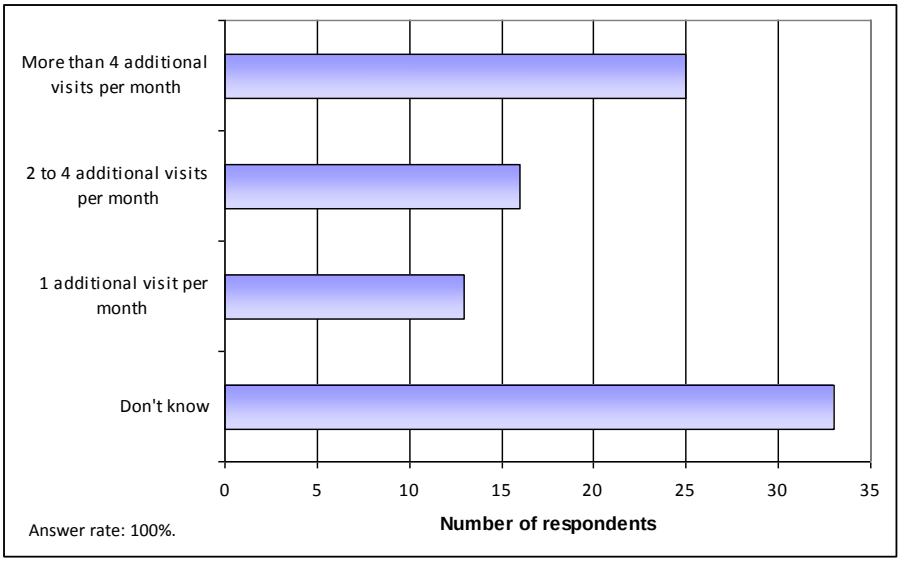
Figure 37: Q20: If the bicycle and pedestrian path at the bank of the river Vesdre was created, would you go along the river Vesdre more often, as often or less often?



Source: SEGEFA-ULg, 2011.

Figure 38 shows the number of additional visits per month to the site (along the river Vesdre) that the survey respondents state they will make. Respondents who answered the question were mainly saying that if the landscaping project is carried out, they will probably make more than 4 additional visits per month.

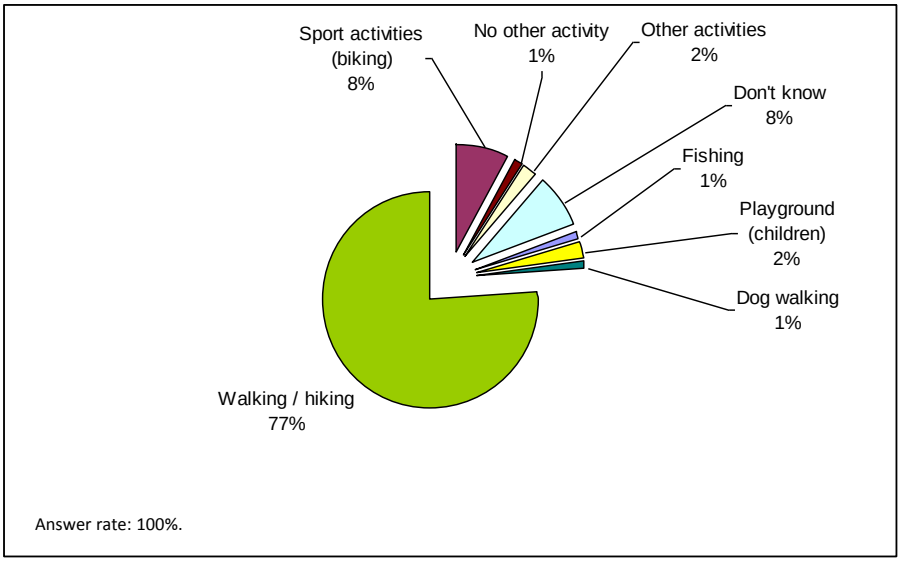
Figure 38: In average, how many additional visits per month to the site (along the river Vesdre) would this correspond to?



Source: SEGEFA-ULg, 2011.

Figure 39 shows the main activities that the respondents will carry out there. As for the "Récollets" path, they will mainly use the path for walking and hiking. However, the new bicycle and pedestrian path is seen more as a recreational site than as a functional site. Indeed, for the new bicycle and pedestrian path, the sport activities ("walking and hiking", "fishing", "dog walking" and "sport activities") gather 87% of respondents, "playground for children" 2% and "other activities", "no other activities" and "don't know" 3%. For the "Récollets" path (fig. 19), the sport activities ("walking and hiking", "fishing", "dog walking" and "sport activities") concern 78% of respondents, "playground for children" 4%, "other activities" and "don't know" 4%. 14% of respondents used the "Récollets" path as shortcut between home and city centre. If we compare the results of the new bicycle and pedestrian path with the results of the question "Which is the main activity you take part in the green areas?" (fig. 43), we can see that the results are similar, because 86% of the respondents said they practice sport activities in green areas.

Figure 39: Q13: Which activity would you carry out there?



Source: SEGEFA-ULg, 2011.

2.2.1.6 Frequentation of Verviers parks & rivers and green areas in the region around Verviers

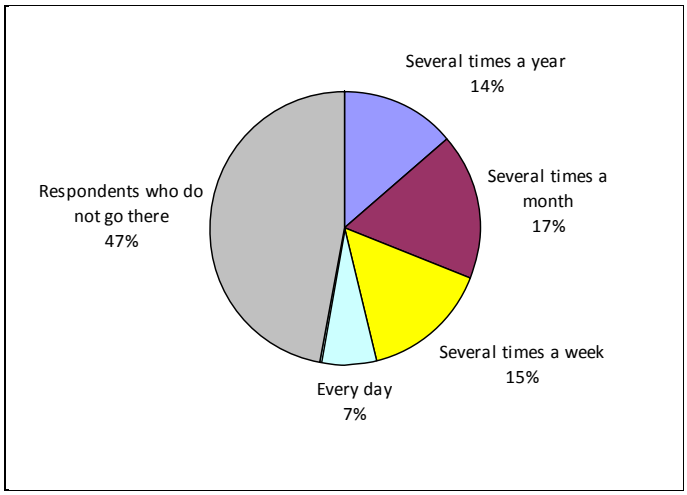
We analyzed the frequentation of parks and rivers in Verviers and green areas in the region around Verviers. The objective is to determine which green spaces people visit, what are the main reasons why people visit these green spaces and at which frequency.

2.2.1.6.1 Frequentation of Verviers parks

46 out of 87 people visit these parks regularly. As figure 40 shows 41% of people visiting the Verviers parks regularly are visiting these parks either “every day” (13%) or “several times a week” (28%).

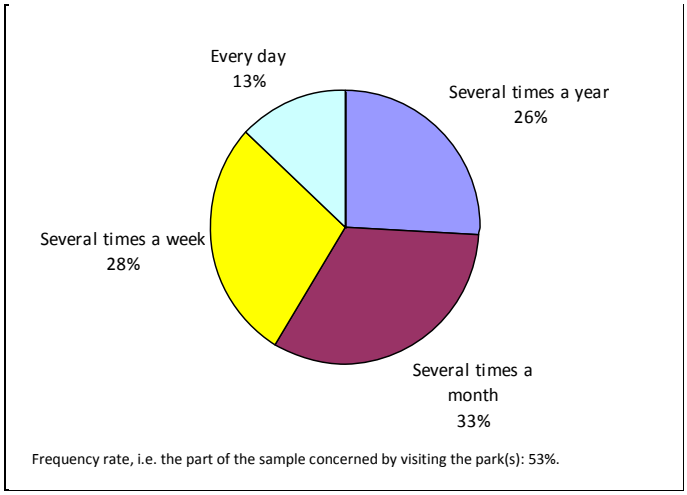
Figure 40: How often do you visit this (these) park(s)?

Fig. 40.1: Whole sample



Source: SEGEFA-ULg, 2011.

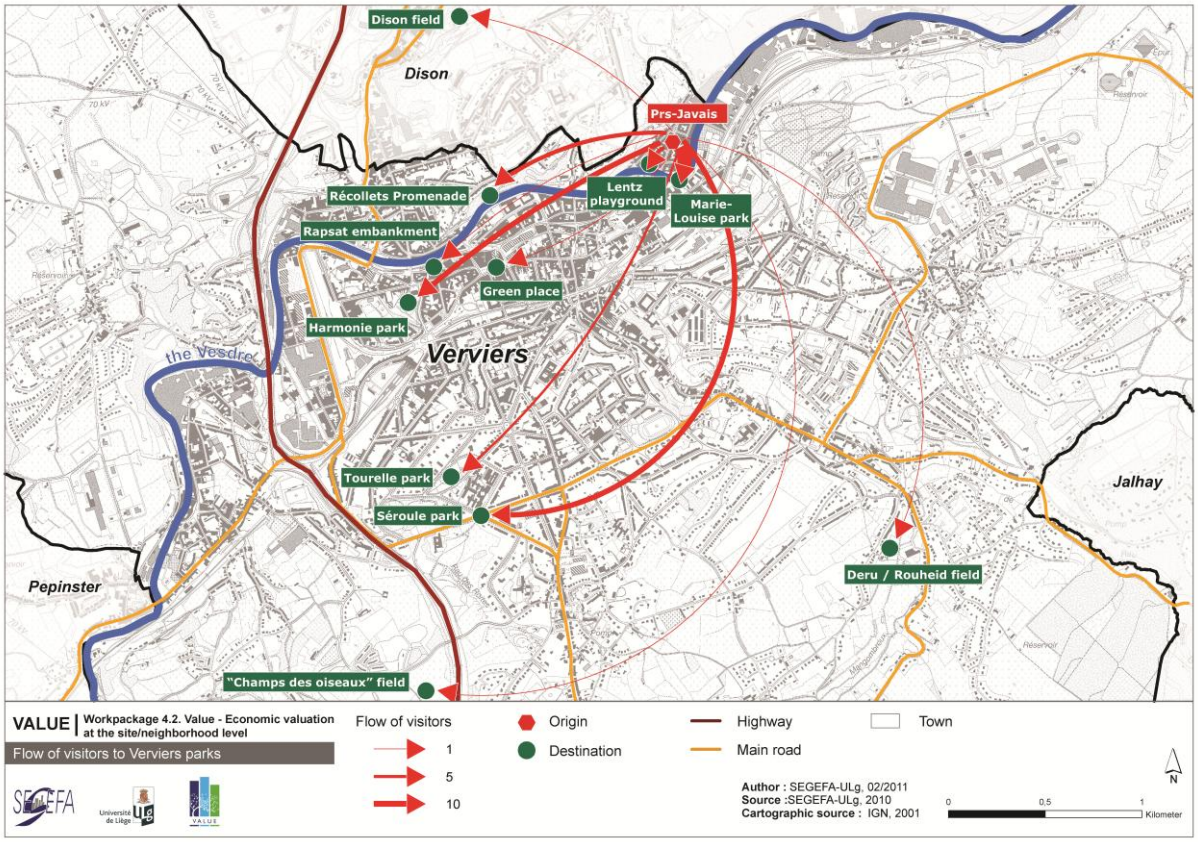
Fig. 40.2: Respondents going to Verviers parks



Source: SEGEFA-ULg, 2011.

Figure 41 illustrates the flow of visitors to Verviers parks. Séroule and Harmonie Parks seem far away from the study area but are the most visited parks. These parks are very well looked after and are preferred by respondents. Table 35 gives the absolute value of visitors to Verviers parks.

Figure 41: Flow of visitors to Verviers parks



Source: SEGEFA-ULg, 2011.

Table 35: Flow of visitors to Verviers parks

Park names	Number of visits
"Champs des oiseaux" field	1
Deru / Rouheid Field	1
Dison field	1
«Place Verte»	1
Harmonie park	9
Lentz playground	6
Marie-Louise park	25
Rapsat embankment	1
Récollets promenade	7
Séroule park	9
Tourelle park	4

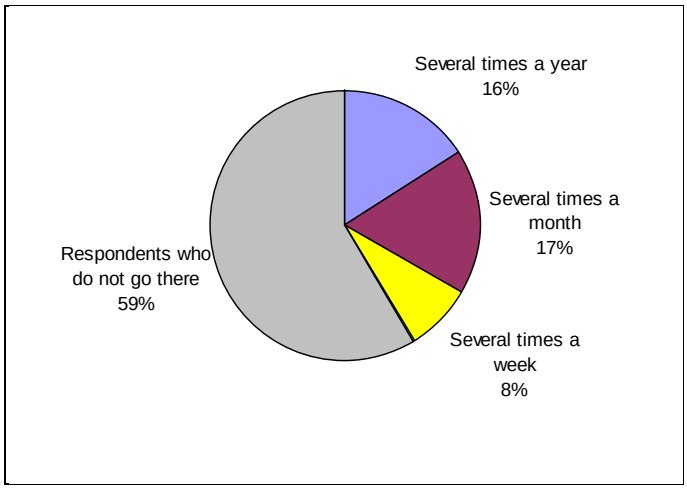
Source: SEGEFA-ULg, 2011.

2.2.1.6.2 Visits to rivers and green areas in the region around Verviers

38 out of 87 people visit rivers and green areas regularly in the region around Verviers. Figure 42.2 shows that 61% of people visiting the rivers and green areas in the region around Verviers do so either several times a week (19%) or several times a month (42%). Figure 43 shows that the main activity that people undertake is walking and hiking (83%). If the project landscaping is carried out, 77 per cent of people, according to the survey, will walk/hike on the new path. On the "Récollets" path, 69 per cent of people affirm that their main activity is walking and/or hiking. Nevertheless, 14 per cent of people use the "Récollets" path as shortcut between home and city centre.

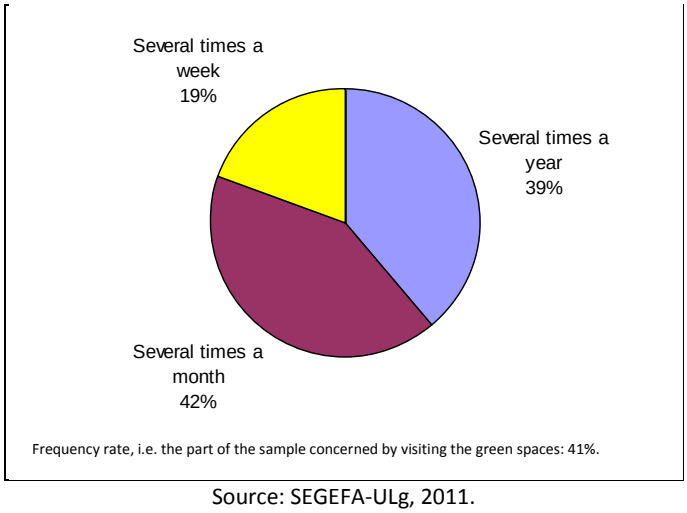
Figure 42: How often do you visit this (these) area(s)?

Fig. 42.1: Whole sample



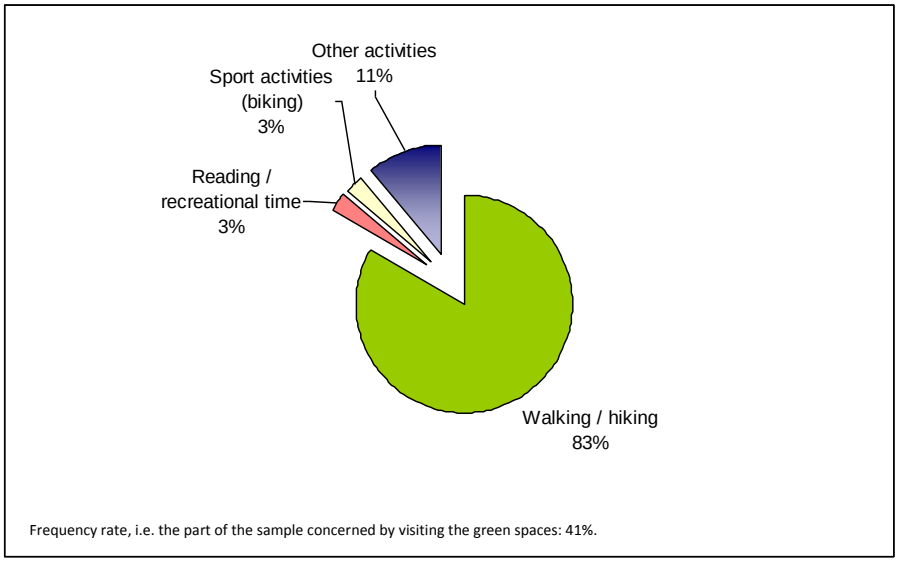
Source: SEGEFA-ULg, 2011.

Fig. 42.2: Respondents going to rivers and green areas in the region around Verviers



Source: SEGEFA-ULg, 2011.

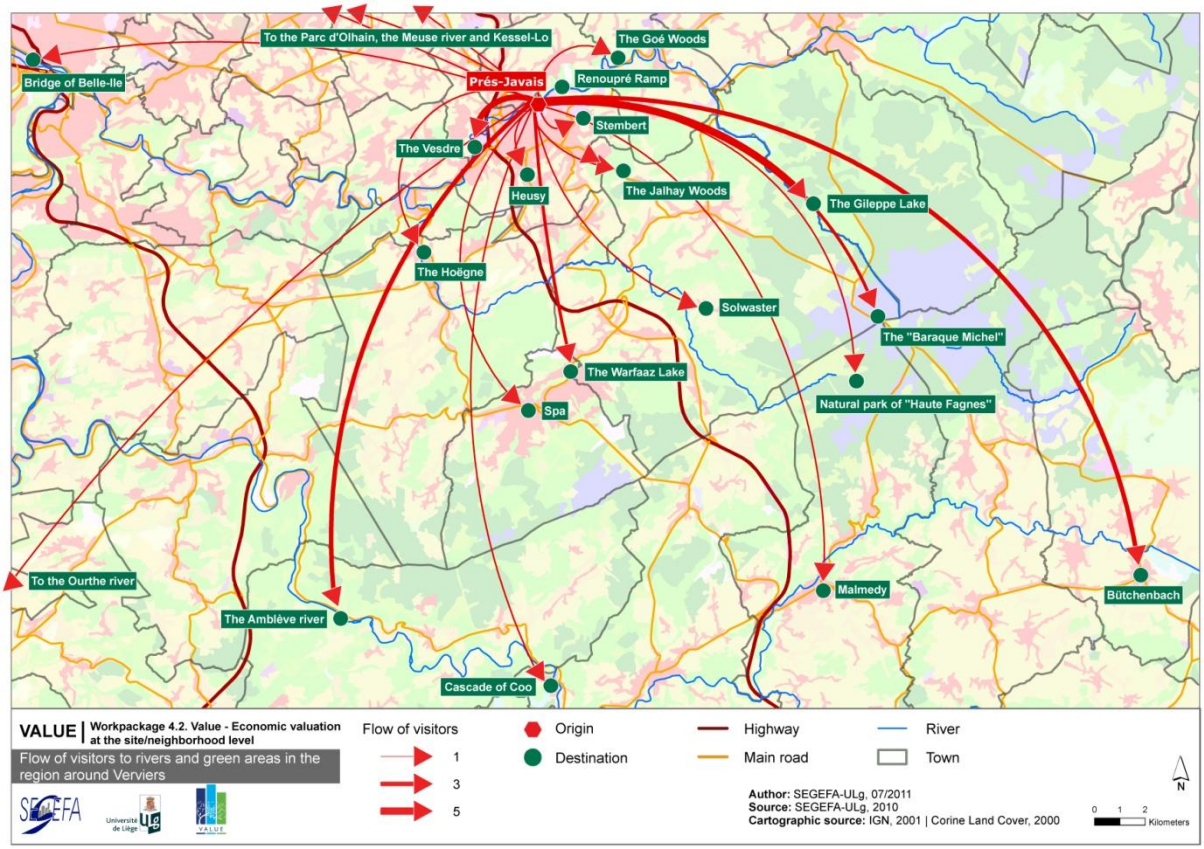
Figure 43: Which is the main activity you take part in these green areas?



Source: SEGEFA-ULg, 2011.

Figure 44 shows the rivers and green areas around Verviers that people are visiting. The more attractive sites are the Vesdre and Amblève River, the Gileppe and Bütchenbach Lake. Table 36 gives the absolute value of visitors to rivers and green areas in the region around Verviers.

Figure 44: Flow of visitors to rivers and green areas in the region around Verviers



Source: SEGEFA-ULg, 2011.

Table 36: Flow of visitors to rivers and green areas in the region around Verviers

Park names	Number of visits
Ardennes	1
Bridge of Belle-Ile	1
Bütchenbach	1
Cascade of Coo	1
City of Spa / Park of Spa	4
Gileppe Dam	2
Heusy	1
Malmedy	3
Natural park of "Haute Fagnes"	1
Olhain park	1
Provincial domain of Kessel-Lo	1
Renoupré Ramp	1
Solwaster	1
Stembert	2
The "Baraque Michel"	3
The Amblève	1
The Goé Woods	1
The Grunhaut woods	5
The Hoëgne	1
The Jalhay Woods	1
The Meuse	1
The Ourthe	1
The Vesdre	10
The Warffaz Lake	1

Source: SEGEFA-ULg, 2011.

2.2.2 Results of the second survey and comparison with the first survey

Initially, the choice was made at the beginning, i.e. during the Technical Workshop in Brussels, to limit the survey to the local population located within a 150 m radius (see figure 4, p.15 and figure 9, p.39). Indeed, the cycling and walking path defined in the framework of VALUE has mainly a local influence. As a result, we conducted the survey among the residents living in the area under study. After having conducted 87 door-to-door questionnaires and analyzed the data, we thought that it could be interesting to analyze the project on a bigger scale. On a small scale, if we divide the total cost of the project by the average WTP given by the respondents, the project is not profitable in terms of economic utility for the residents. As a consequence, we implemented a second survey focused on the population of the urban region (Luyten et al., 2009), in order to determine if the project would be profitable on a bigger scale. The researcher conducted the second survey on-street and interviewed 96 people passing by the «Place Verte» in Verviers (Place Verte) (see figure 4, p.14 and see appendix 5.4: Visual aids used during the face-to-face interview). In this part of the report, we will explain the implementation and analyze the results of the second survey. We can already say that according to the cost-benefit analysis the project presented during the first survey is not

profitable. However, the project seems to be profitable if we conduct the same analysis on a larger scale, i.e. on the scale of the city of Verviers. To develop the sample, we used the same method as for the first survey to calculate the sample size required (see below table 37). The target population is made up of the population of the Verviers urban region, which comprises the cities of Verviers, Dison, Pepinster, Jalhay, Theux, Limbourg, Thimister-Clermont and counts 106,611 people (Luyten et al., 2009). We conducted 96 interviews, of which 12 interviewees live outside Verviers and 10 interviewees either did not answer or gave a street name not found in Verviers's directory.

Table 37: Choosing the sample size

95% confidence interval

Target population	106,611	106,611	106,611	106,611	106,611	106,611
Proportion in true sample	0.5	0.5	**0.5**	0.2	0.2	0.2
Accuracy standard error x 2	±3%	±5%	**±10%**	±3%	±5%	±10%
Sample size required – finite population	1,057	383	**96**	679	245	61
Sample size required – infinite population	1,067	384	**96**	683	246	61

Source: SEGEFA-ULg, 2011; Adapted from Bateman, 2002 p.109,
Creative Research System - website, 2010, Raosoft - website, 2004 and RMDP – website, 2011.

The results are summarized below.

Socio-economic data

- **Gender distribution**: the percentage of women interviewed is less important for the second survey (49% for the second survey and 56% for the first survey).
- **Age distribution**: people aged 60 and over are less represented than in the first survey (23% for the second survey and 33% for the first survey) whereas people aged between 30 and 59 are more represented (53% for the second survey and 48% for the first survey).
- **Employment distribution**: in the second survey, more respondents picture themselves as "worker" or "student" instead of "retired" and "social beneficiary"; the unemployment rate is 35% for the second survey. The unemployment rate is here 7 points higher than for the first survey (28%).
- **Household composition**: the proportion of 4-person households is the same in the two surveys, the percentage of single household is lower; households without children under 15 years old are more represented.
- **Education**: stronger representation of respondents holding a higher vocational education and weaker representation of respondents having only finished their primary education.
- **Ownership rate and motorized rate**: the ownership rate is 44% (1 point less than for the first survey) and the motorized rate is 58 % (2 points less than for the first survey).

- **Salary level of the respondents**: the salary level of respondents (tenant and owner) is higher in the second survey than in the first survey.

Table 38: Summary table of the survey results

Demographic Data	First survey	Second survey
Gender distribution:		
Percentage of women	56%	49%
Age distribution:		
15-19 years old		4%
20-29 years old	16%	19%
30-49 years old	32%	35%
50-59 years old	16%	18%
Over 60 years old	33%	23%
No answer	2%	1%
Profession distribution:		
Worker	39%	44%
Social beneficiary	28%	24%
Retired person	26%	21%
Student	6%	11%
No answer	1%	0%
Household composition:		
Single household rate	33%	26%
Percentage of 2-person households	26%	26%
Percentage of 3-person households	9%	17%
Percentage of 4-or-more-person households	31%	31%
Children under 15 years old:		
None	62%	60%
1 child	15%	19%
2 children	20%	16%
3 children	1%	2%
4 children	2%	3%
5 or more children	0%	0%
Education:		
Higher academic education	5%	18%
Higher vocational education	13%	24%
Superior secondary education	34%	30%
Inferior secondary education	22%	16%
Primary education	24%	6%
No answer	2%	0%
Ownership rate and motorized rate:		
Ownership rate	45%	44%
Motorized rate	60%	58%
Salary level of households:		
Less than 500	2%	0%
From 500 to 900	11%	8%
From 900 to 1500	28%	16%
From 1500 to 2000	14%	14%
From 2000 to 3000	13%	16%
From 3000 to 4000	1%	5%
No answer	31%	42%

Source: SEGEFA-ULg, 2011-2012.

2.2.2.1 The “Récollets” path

- **Knowing the path**: 75% of the surveyed population stated knowing the path. This question had not been asked in the first survey, because of the close location.
- **Frequency of visits to the path**: among the 51 respondents out of 96 (to 56 out of 87 for the first survey) stating going to the “recollects” path, 55% stated visiting the path “several times a year”. However, only 18% stated visiting the “Récollets” path more frequently reporting either “every day” or “several times a week”. In the first survey, they were a third saying visiting the path more frequently.
- **Reasons for not going there**: in the second interview, the respondents gave mainly “other reasons” as answer to the question “for which reasons do you not go there?” 8 respondents out of 9 mentioned that the path was too far from the city centre and they didn’t have the opportunity to go there and 1 respondent mentioned that he didn’t want to walk any more.
- **Activity**: a larger majority (78%) than for the first survey (69%) goes to the “Récollets” path for “walking and/or hiking”. Only 4% of the respondents (14% for the first survey) use the path as “shortcut between home and city centre”. The next activities are: “dog walking” (6%) and “shortcut between home and workplace” (2%).
- **Cleanliness and safety**: amongst the group of 51 respondents, 37% agreed or strongly agreed (64% for the first survey) that there are cleanliness problems on the “Récollets” path and 27% safety problems (58% for the first survey).

Table 39: Summary table of the "Récollets" path data

"Récollets" path	First survey	Second survey
Knowing the path:	-	75%
Visit frequency of the path:		
Several times a year	39%	55%
Several times a month	27%	27%
Several times a week	20%	4%
Every day	13%	14%
(Don't know)	2%	0%
Reasons for not going there:		
I don't know this river	19%	0%
I don't like this river	3%	5%
For health reasons	13%	0%
For safety reasons	13%	19%
Lack of time	16%	10%
I don't think about it	3%	10%
I have my own garden	0%	0%
Other reasons	13%	43%
(Don't know)	19%	14%
Activity:		
Walking/hiking	70%	78%
Dog walking	5%	6%
Reading/ recreational time	0%	0%
Playground (children)	4%	0%
Shortcut – between home and workplace	0%	2%
Shortcut – between home and city centre	14%	4%
Sport activities (biking)	2%	0%
Fishing	2%	10%
Other activities	2%	0%
(Don't know)	2%	0%
Cleanliness of the path:		
Strongly agree	46%	27%
Agree	18%	45%
Disagree	11%	4%
Strongly disagree	18%	24%
(Don't know)	7%	0%
Safety of the path:		
Strongly agree	32%	29%
Agree	27%	24%
Disagree	9%	12%
Strongly disagree	29%	35%
(Don't know)	4%	0%

Source: SEGEFA-ULg, 2011-2012.

2.2.2.2 The Contingent Valuation Method

2.2.2.2.1 Identifying non-valid responses

The questionnaire proposed follow-up questions in order to identify non-valid responses.

Table 40: Answers to the follow-up question asking why the respondent gives a zero WTP

For which reasons do you not wish to pay?	***Second survey (Absolute value)***	***First survey (Absolute value)***
I shouldn't be the one paying	2	*5*
The district should be the one paying		*6*
It is not necessary to modifiy the state of this river		
My financial means won't allow me to pay	19	*9*
I don't have enough information on which to base a decision		
I am afraid of paying for others		
It would prevent me from taking part in my activities		
I already pay to take part in a leisure activity		
I don't want the river to be modified		
I don't feel concerned	1	
Other reasons	21	*21*
(Don't know)*	*(1)**	*(1)**
Total	*43*	*41*

* Values excluded from the analysis
Source: SEGEFA-ULg, 2012.

43 respondents out of 95 gave a zero WTP, which represents 44% of the respondents. For the first survey, 47% gave a zero WTP. Among the group of 43 respondents, 44% justify their refusal to pay by claiming that "their financial means would not allow them to pay". 5% mentioned that they "should not be the one paying". 49% of respondents, among the group of 43 respondents refusing to pay, mentioned "other reasons" as justification of their position. The other reasons mentioned were:

- "Taxes are already high enough" - 13 respondents.
- "Savings could be invested in other projects" - 4 respondents.
- "That is how it is" - 1 respondent.
- "That is not in my interest" - 1 respondent.
- "Useless" - 1 respondent.
- "The number of potential visits to the site is not sufficient" - 1 respondent.

It does not seem that any of respondents of the second survey gave an irrational value. Therefore, for the second survey, all WTP answers have been taken into account and only the "don't know" answer has been excluded.

2.2.2.2.2 The sample mean WTP

The table 41 shows the distribution of the respondents between the different WTP values and table 42 reports the statistical analysis of the WTP for the contingent valuation question.

Table 41: Distribution of the respondents between the different WTP values for the Contingent valuation question – "Natural plant cover"

	Second survey	***First survey***
200		*(1)**
150		
100		
80		
70		*(1)**
60	2	*1*
50	1	*3*
40	2	
35		*1*
30	9	*2*
25	36	*32*
20		
15	1	*1*
10	1	*2*
5		
0	43	*41*
*(NSP)**	*(1)**	*(1)**
Total	*95*	*84*

* Values excluded from the analysis
Source: SEGEFA-ULg, 2012

Table 42: Statistical analysis – Contingent valuation question – "Natural plant cover"

		N	Min	Max	Sum	Mean	Median
Second survey	*Natural plant cover* - with the 0 values	95	0	60	1,445	15.21	25
	Natural plant cover - without the 0 values	52	10	60	1,445	27.79	25
First survey	*Natural plant cover* - with the 0 values	84	0	100	1,240	14.76	10
	Natural plant cover - without the 0 values	43	10	100	1,240	28.84	25

Source: SEGEFA-ULg, 2012.

If we take the 0 values into account, the arithmetical mean of the sample is €15.21. In the first survey, the arithmetical mean was €14.46. Nevertheless, if we do not take into account the 0 values, the arithmetical mean is €27.79. It was €28.84 for the first survey. We come to the conclusion that more respondents are willing to pay in the second survey (55%) than in the first (51%). Nevertheless, in the second survey, respondents gave in general a smaller WTP than in the first survey. There is a very small difference between the average "willingness to pay" given by respondents of both surveys. It is interesting here to notice that the income of respondents of the second survey is a little bit higher than the income of respondents of the first survey, even if the difference is not statistically significant. We can wonder about the notion of "civic involvement", which seems to be more developed when we asked people at home than when we asked random people on the street.

2.2.2.3 The Choice Modelling Method

2.2.2.3.1 The sample mean WTP

Table 43 shows the distribution of the respondents between the different WTP values and table 44 reports the statistical analysis of the WTP for the choice modelling question – *barren path* scenario.

Table 43: Distribution of the respondents between the different WTP values for the Choice modelling question – "Barren path scenario"

	Second survey	***First survey***
200		*(1)**
150		
100		
80		
70		
60		
50	1	*2*
40	1	
35		*1*
30	1	
25	18	*7*
20	1	*1*
15	2	
13		*1*
10		
5	2	
0	69	*71*
*(NSP)**	*(1)**	*(3)**
Total	*95*	*83*

* Values excluded from the analysis
Source: SEGEFA-ULg, 2012

Table 44: Statistical analysis – Choice modelling question – "Barren path scenario"

		N	Min	Max	Sum	Mean	Median
Second survey	*Barren path scenario* - with the 0 values	95	5	50	630	6.56	0
	Barren path scenario - without the 0 values	26	5	50	630	24.23	25
First survey	*Barren path scenario* - with the 0 values	83	13	100	343	4.13	0
	Barren path scenario - without the 0 values	12	0	100	343	28.58	25
Second survey	*Natural plant cover* - with the 0 values	95	0	60	1,445	15.21	25
	Natural plant cover - without the 0 values	52	10	60	1,445	27.79	25
First survey	*Natural plant cover* - with the 0 values	84	0	100	1,240	14.76	10
	Natural plant cover - without the 0 values	43	10	100	1,240	28.84	25

Source: SEGEFA-ULg, 2012

People are less willing to pay for this scenario than for the *natural plant cover*. We could draw the same conclusion from the first survey. The data highlight that more respondents are willing to pay for the *barren path* scenario in the second survey (27%) than in the first survey (14%) because the mean of WTP given by respondents with the 0 values is slightly higher (€6.56) than in the first survey

(€4.13). However, if we compare the mean of WTP given by respondents without the 0 values, respondents gave a smaller WTP (€24.23) for the second survey than for the first survey. However, the data does not seem to show any clear statistical correlation between the results for two surveys. The table 45 shows the distribution of the respondents between the different WTP values and table 46 reports the statistical analysis of the WTP for the choice modelling question – structured vegetation.

Table 45: Distribution of the respondents between the different WTP values for the Choice modelling question – "Structured vegetation"

	Second survey	***First survey***
200		*(1)**
150		
100		
80		
70		*(1)**
60	2	*1*
50	4	*4*
40	2	
35		*2*
30	5	*2*
25	23	*19*
20		
15	4	
10	1	
5	1	
0	53	*56*
*(NSP)**	*(1)**	*(1)**
Total	*95*	*84*

* Values excluded from the analysis
Source: SEGEFA-ULg, 2012

Table 46: Statistical analysis – Choice modelling question – "Structured vegetation"

		N	Min	Max	Sum	Mean	Median
Second survey	*Structured vegetation* - with the 0 values	95	5	50	1,200	12.5	0
	Structured vegetation - without the 0 values	42	5	50	1,200	52.17	25
First survey	*Structured vegetation* - with the 0 values	84	0	100	865	10.30	0
	Structured vegetation - without the 0 values	28	25	100	865	30.89	25
Second survey	*Barren path scenario* - with the 0 values	95	5	50	630	6.56	0
	Barren path scenario - without the 0 values	26	5	50	630	24.23	25
First survey	*Barren path scenario* - with the 0 values	83	13	100	343	4.13	0
	Barren path scenario - without the 0 values	12	0	100	343	28.58	25
Second survey	*Natural plant cover* - with the 0 values	95	0	60	1,445	15.21	25
	Natural plant cover - without the 0 values	52	10	60	1,445	27.79	25
First survey	*Natural plant cover* - with the 0 values	84	0	100	1,240	14.76	10
	Natural plant cover - without the 0 values	43	10	100	1,240	28.84	25

Source: SEGEFA-ULg, 2012

It is quite clear from this data that they are more people "willing to pay" for the *natural plant cover* (55%) than for the *structured vegetation* (44%). Additionally, if we take into account the value 0, people are less "willing to pay" for the *structured vegetation* scenario (€12.5) than for the *natural plant cover* (€15.21). In the first survey, less people were "willing to pay" for the *structured vegetation* (33% in the first survey and 44% in the second survey) and people were less ready to pay for this scenario (€10.30 in the first survey and €12.5 in the second survey). Nevertheless, there are differences in the WTP given by respondents; these differences are too small to be considered as statistically significant.

2.2.2.3.2 Why did you choose this option?

Respondents chose at 55% the *natural plant cover* as preferred scenario, followed by the *structured vegetation* scenario at 39% and the *barren path* scenario at 6%. The above mentioned results are in contradiction with the results of the first scenario. Indeed, for the first survey 46% of respondents preferred the *structured vegetation* scenario, followed by the *natural plant cover* (25%) and the *barren path* scenario (13%).

Table 47: Percentage of respondents choosing each scenario

Scenarios	Second survey	First survey
Natural plant cover	55%	13%
Barren path	6%	25%
Structured vegetation	39%	46%

Source: SEGEFA-ULg, 2012

After having asked to the respondents their preferred scenario, we asked them to justify their choice. As in the first survey, for the *structured vegetation* scenario, people's comments focused on "beauty", "beautiful colours", "liking nature", "liking flowers", "employment", "cleaner", "safer". For the *barren path* scenario, people said that this scenario would be "better for the maintenance and less expensive", "the gravel path could represent a playground for children", "it is clean, it does not encourage people to throw away the litter", "the flowers are very nice but I am afraid that they could be devastated" and "it would last longer because it is stronger". For the *natural plant cover*, people brought out the following statements to justify their choice: "lower cost alternative", "more natural", "last longer time", "less maintenance needed", "enable the creation of an ecosystem", "more adequate for people who have breathing problems".

2.2.2.3.3 Visual aids

In the second survey, the visual aids were very or moderately useful for 89% of respondents. They were 91% thinking that the visual aids were very or moderately useful in the first survey. The correlation is not statistically significant. Nevertheless, it is important to mention that we presented the visual aids to respondents directly in the street for the second survey. The first survey was conducted from door-to-door and people took more time to look at the pictures. In this case, we presented the visual aids either on their doorstep or in their home.

2.2.2.3.4 Site visiting

In the second survey, 85 respondents out of 96 stated that if the landscaping project was carried out, it would encourage the respondents to visit the site (89%). In the first survey, they were 91% to state that if the landscaping project were carried out, it would encourage them to visit the site.

In the second survey, 64% of respondents said that they would go along to the river Vesdre more often if the bicycle and pedestrian path at the bank of the river Vesdre was created (to 61% in the first survey).

The difference between the two surveys is still not statistically significant. Nevertheless, in attempt to explain the difference, the following comment can be made: the respondents of the first survey are probably less likely to or don't go on holidays and therefore visit the parks more often in Verviers and the green areas around Verviers. Indeed, we asked respondents if they regularly visit certain Verviers parks and rivers/green areas in the region. Their answer was an average which varied according to the time of the year; they most probably visited the parks more often during summer and less often during winter. The respondents of the second survey probably go on holidays more frequently.

2.2.2.3.5 Visits to Verviers parks and rivers and green areas in the region around Verviers

2.2.2.3.5.1 Do you regularly visit certain Verviers parks?

65 out of 96 people visit these parks regularly. 32% of people who visit the Verviers parks regularly are visit these parks either "every day" (11%) or "several times a week" (22%). In the first survey, 41% of people stated that they visited these parks. In the second survey, respondents visit, in decreasing order of frequency, Harmonie park, Séroule park and Tourelle park, as the table 48 shows. In the first survey, respondents stated that they mainly visited the Marie-Louise park, followed by Harmonie and Séroule parks (see table 35: Flow of visitors to Verviers parks – First survey).

Table 48: Flow of visitors to Verviers parks

Park names	Number of visits
"Champs des oiseaux" field	0
Deru/Rouheid field	0
Dison field	2
«Place Verte»	1
Harmonie park	32
Lentz playground	1
Peltzer playground (Concorde Street)	1
Marie-Louise park	1
Raspat embankment	0
Récollets promenade	1
Récollets park	1
Séroule park	15
Tourelle park	9
Vita path (Heusy-Ensival)	1
Fabiola park	0

Source: SEGEFA-ULg, 2012.

2.2.2.3.5.2 Do you regularly visit rivers and green areas in the region around Verviers?

59 out of 96 people regularly visit rivers and green areas in the region around Verviers. 41% of these people visit the rivers and green areas in the region around Verviers either several times a week (8%) or several times a month (32%). Compared to the first survey, fewer respondents state that they visit this(these) area(s) either several times a week or a month. There is a 20-point difference between the two surveys. The main activity that people undertake is walking and hiking (75%). The other activities are dog-walking (4%), reading, and recreational time (2.5%) and sport activities (biking) (2.5%). Nevertheless, 11% of the people interviewed stated that they go to the park either for jogging or for meeting people.

People mainly visit the following rivers and green areas in the region: the Vesdre, the City of Spa and the Hoëgne (tributary of the Vesdre). People mentioned Spa as a green area. They visit either parks in the city or green areas surrounding the City of Spa, as table 49 shows. In the first survey, they stated that they go mainly to the Vesdre, and then Grunhaut Woods and City of Spa (see table 36: Flow of visitors to rivers and green areas in the region – First survey).

Table 49: Flow of visitors to rivers and green areas in the region

Park names	Number of visits
Banneux	2
Botanique garden (Liège)	2
Boverie park (Liège)	2
City of Dolhain	1
City of Francorchamps	1
City of Jalhay	1
City of Liège	1
City of Pepinster	1
City of Spa / Park of Spa	11
City of Theux	1
Forestia activity park	1
Gileppe Dam	2
Heusy cemetery	1
In the whole region	3
Natural park of « Hautes Fagnes »	3
Renoupré	1
Stanneux	1
Stavelot	1
The Amblève	1
The Berwinne (affluent of the Meuse)	1
The Eau d'Heure Lake	1
The Gileppe (affluent of the Vesdre)	4
The Gileppe Lake	7
The Hoëgne (affluent of the Vesdre)	8
The Meuse	3
The Netherlands	1
The Nids d'Aguesses Woods	1
The Ourthe	1
The Vesdre	14
Waffa Lake	2
Walking and hiking path	2
Wégimont park	2

Source: SEGEFA-ULg, 2012.

In conclusion, fewer respondents of the second survey stated that they visit parks in and around Verviers compared with the first survey. We can explain it by the socio-economic profile of the

surveyed population and the habitat characteristics. The respondents of the second survey live mainly in the suburbs of Verviers. They go to the city centre for particular reasons such as shopping, visiting a doctor, or a local administration etc. Most respondents of the second survey own a private garden and therefore do not feel the need to visit parks and rivers. The respondents of the first survey live mainly in flats. People consequently use public gardens to spend time and as space for recreational activities.

The time space from the project site show us that in the first survey, 60% of people interviewed lived between 2 and 4 min time space and in the second survey 60% of people interviewed lived at more than 15 min time space (see table 50 below).

Table 50: Time space from the project site

Time space	*Second survey*	*First survey*
[0 - 2]	1%	2%
] 2 - 4]	1%	60%
] 4 - 6]	3%	24%
] 6 - 8]	1%	3%
] 8 - 10]	7%	10%
] 10 - 15]	24%	0%
] 15 - 20]	16%	0%
> 20	42%	0%
No answer	9%	0%

Source: SEGEFA-ULg, 2012.

Table 51: Correlation between time space and WTP for the first survey

Time space	WTP	Number of respondents by stated WTP	% of respondents by stated WTP
[0 - 2]	0	2	100%
Total		**2**	
] 2 - 4]	***0***	23	47%
	10	1	2%
	15	1	2%
	25	19	39%
	30	1	2%
	35	1	2%
	50	2	4%
	*(70)**	*(1)**	
	100	1	2%
	*(200)**	*(1)**	
	*(NSP)**	*(1)**	
Total		**49**	
] 4 - 6]	***0***	10	48%
	10	1	5%
	25	9	43%
	60	1	5%
Total		**21**	
] 6 - 8]	***0***	2	67%
	25	1	33%
Total		**3**	
] 8 - 10]	***0***	4	44%
	25	3	33%
	30	1	11%
	50	1	11%
Total		**9**	

* Values excluded from the analysis
Source: SEGEFA-ULg, 2012.

Table 52: Correlation between time space and WTP for the second survey

Time space	WTP	Number of respondents by stated WTP	% of respondents by stated WTP
[0 - 2]	25	1	100%
Total		**1**	
] 2 - 4]	0	1	100%
Total		**1**	
] 4 - 6]	0	1	33%
	30	2	67%
Total		**3**	
] 6 - 8]	0	1	100%
Total		**1**	
] 8 - 10]	**0**	3	50%
	25	2	33%
	30	1	17%
Total		**6**	
] 10 - 15]	**0**	10	45%
	15	1	5%
	25	9	41%
	30	1	5%
	40	1	5%
Total		**22**	
] 15 - 20]	**0**	6	40%
	25	*7*	47%
	60	2	13%
Total		**15**	
> 20	**0**	18	46%
	25	15	38%
	30	4	10%
	40	1	3%
	50	1	3%
Total		**39**	
Data not available		**8**	

Source: SEGEFA-ULg, 2012.

Tables 51 and 52 illustrate the (possible) existence of a correlation between time space and WTP given by respondents. In the first survey, respondents didn't live more than 10 minutes walk away from the VALUE investment. We can note that the number of people giving a €0 WTP increases slightly for the time space] 2 - 4] to] 6 - 8] and decreases for the time space] 8 - 10]. In the second survey, respondents lived from] 0 - 2] minutes walk away up to more than 20 minutes walk away from the VALUE investment. The number of people giving a €0 WTP decreases for the time space] 2 - 4] to] 15 - 20] and increases for the time space > 20. The WTP seems to be correlated to the time space. We can conclude that respondents living nearer the VALUE investment are less "willing to pay" for the green infrastructure project than respondents living further away up to beyond a certain distance (>20 minutes walk away).

2.2.3 Discussion

The present report dealt with economic valuation of green infrastructure, in particular of the planned cycling and walking path along the river Vesdre. The planned and existing green corridors are composed of 13 sites along the river Vesdre and could be connected to other green corridors (see figure 2 p. 10). One of the 13 sites has been chosen for the VALUE project. The main reason of this choice is that one of the objectives of the creation of this path was to link the "Récollets" path to the Couvalles economic development area. To elicit community preferences for local development, we conducted two surveys. We conducted one survey in January/February 2011. We interviewed 87 people from door-to-door in the Prés-Javais, Quartier Est, Saint-Remacle and Mamelon Vert statistical districts. The choice was done from the beginning (cf. Technical Workshop in Brussels) to limit the survey to the local population located within a 150 m radius (Economic valuation at site/neighbourhood scale). Two stated choice models have been used to elicit the WTP of the respondents: contingent valuation and choice modelling. During our research, we found out that it could have been interesting to survey the potential user of the path. We therefore conducted a second survey in the city centre of Verviers, for which we interviewed 96 people in December 2011 /January 2012.

We would like here to discuss, firstly, the results and secondly, the methodology employed for the economic evaluation of the path.

2.2.3.1 Results

The results of both surveys show that people are concerned by the maintenance of the "Récollets" path because they use the path for walking and hiking and/or as a shortcut between home and city centre. The respondents mentioned their interest in improving the safety and cleanliness of the path. In the light of both survey results, more than half of the respondents answered "yes" to the WTP question for the contingent valuation research. The contingent valuation method found that 38 per cent of the respondents were willing to pay €25 for the *natural plant cover* in both surveys. In the first survey, the choice modelling found that respondents preferred the *structured plant cover* scenario but were less willing to pay for this scenario than for the *natural plant cover* scenario. In the second survey, more respondents chose the *natural plant cover* as preferred scenario. We can say that both surveys had confirmed the urban planner's recommendations, namely the *natural plant cover*.

We would like here to compare the results of both surveys for the following categories: demographic data, "Récollets" path, Contingent valuation, Choice modelling and level of visits.

- *Demographic data:*

In the second survey we see a rejuvenation and masculinisation of the population interviewed. The respondent-type works and lives in at least a 2-person household. He holds a vocational higher education and his salary is on average higher than for the previous sample.

- *"Récollets" path:*
  - From the results of the first survey, we concluded that the "Récollets" path is underused because of security and safety issues. Indeed, the quality of a green investment has an impact on the effective use of the path
  - From the results of both surveys, the "Récollets" path seems to be underused because of the location of the green infrastructure. In the first survey, the path does not offer a shortcut to the city centre for the residents living on the left bank of the river Vesdre. In the second survey, the path is a little bit far from the city centre for surburban people who go to the centre primarily for shopping or buying lunch. Moreover, the lack of visibility of the "Récollets" path and of connecting links between the city centre and the path can explain the low frequency of visits to the "Récollets" path.
- *Contingent Valuation:*
  - Respondents of the second survey, like their counterparts in the first survey, are willing to pay for the green infrastructure project.
  - The respondents were « willing to pay » 14.76 Euros for the *natural plant cover* in the first survey and 15.21 Euros in the second survey. From the perspective of the cost-benefit analysis, we can say that at the district scale the residents need to contribute almost 15 Euros per year for several generations (117 years) to cover the investment (estimated around EUR 1,500,000) (1,500,000/14.76*867=117 years). At the city scale, Verviers counted 25,096 households in 2008. The residents need to contribute only 4 years to cover the investment (1,500,000/15.21*25,096=4). We have concluded that the current project is not profitable in terms of economic utility for the residents at the district scale but very profitable at the city scale.[12]
- *Choice Modelling:*
  - Respondents of the second survey chose the *natural plant cover* as preferred scenario whereas respondents of the first survey chose the *structured plant cover* as preferred scenario.
  - In the both surveys, respondents were more « willing to pay » for the *natural plant cover* than for the other scenarios, which meet the expectations of the developers. However, in the first survey, they would have preferred the *floral landscaping* but they were not « willing to pay » for it, and in the second survey, they would prefer the *natural plant cover* and they are « willing to pay » for it. The decision made by the respondents of the second survey seems to be more rational. The main statements justifying their choice focus on:
    - the lower cost required for creating and maintaining the path,
    - the preservation of the natural aspect of the river,
    - the possible creation of an ecosystem.
- *Frequency of visits:*
  - Fewer people in the second survey stated that they visited certain Verviers parks on a regular basis, i.e. "every day" or "several times a week", and rivers and green areas in the region

[12] For us, the interest of the work was to assess the profitability of the project to justify the location of the investment. The economic valuation was used as a tool to show the profitability of the project and help planners to target the green investments.

around Verviers, i.e. “several times a week” or “several times a month”. We can explain this by the fact that most respondents have working activities; their free time is also more limited. Secondly, most respondents own a private garden and therefore do not feel the need to visit parks and rivers. The respondents of the first survey live mainly in flats. People use by consequent the public gardens to spend time and as space for recreational activities.

The following conclusions have been drawn from the present study:

- According to the results of the first survey, the initial choice of creating a new path was not the right choice.
- It would have been more effective to improve the quality and accessibility of the “Récollets” path.
- It would have been more effective to improve the district image rather than to give the priority to economic activities. Indeed, as the business focus group highlighted, businesses value green infrastructures but green infrastructures are not the decisive elements for the location of the company.
- Care should be taken not to scatter investments and resources by prioritising sites without considering the investments on a bigger scale, namely the development of the greenway at the city scale.
- In the second survey, a few people drew our attention to the fact that they were ready to volunteer for cleaning the path and the river. They said that it is the responsibility of the local communities to help maintain and clean local environments. In addition, it could have an educational impact on the users of the green infrastructure.

2.2.3.2 Methodology

We have undertaken an ex-ante CBA to evaluate the green infrastructure.

2.2.3.2.1 What we could not have done:

➢ *Ex-post study:* The green infrastructure investment had not yet been initiated in Verviers. It is why we could not lead the same study ex-post, i.e. after the investment, in order to know the real use of the infrastructure by the users. We would like to highlight that it could have been interesting to carry out an assessment before (ex ante valuation) and after (ex post valuation) the creation of the path. We did the evaluation before the construction of the path has been completed. We asked people about their preference for the scenario development before the project was completed, but after the choice of the scenario has already been made by the people in charge of the creation of the path. A few respondents made negative comments on the fact that the choice of scenario preceded the implementation and their opinion would not make any difference.

➢ *Study of the path along the river Vesdre in its entirety:* It could have been very interesting to study the development of the path in its entirety. However, conducting a study on a larger scale with a longer time-frame is not possible in Wallonia. Indeed, we don’t have the choice of changing the scale of the analysis in Wallonia because of the spatial importance of the urban decline.

2.2.3.2.2 What we could have done:

➢ *Questionnaire design:* At the beginning of the questionnaire, we should maybe have asked few questions concerning the respondents' environment and then come with more relevant questions for the project instead of having directly said about which subject we would like their opinion. This approach might have helped us to get more potential respondents involved. Nevertheless, an effective questionnaire should not take too long to complete and consequently the design of a questionnaire is always a matter of trade-offs.

➢ *WTP question:* The WTP question in the contingent valuation method, which helps to place monetary value on green infrastructure, could have been asked in different ways. For example, we could have formulated the question in this way: « Are you ready, you or the city council financed by your tax contributions, to support this development financially and if yes, how much? » or « With the development of the walking and cycling path, are you ready to give up your car for the bicycle » . It could have allowed us not to influence the respondents on the amount they were willing to pay. As the French Sustainable Development General Commission mentioned, we have noticed that as we progress with the questionnaire the answers were more the expression of lassitude of the respondents than a choice expression. The WTP of respondents didn't decrease so much as the scenarios were presented. Nevertheless, we feel that respondents got a bit irritated or annoyed with the WTP questions. That is why we should not have asked people their WTP for each scenario. It might have been more useful to ask the WTP question only for the status quo, and then to present them a table summing up all possible choices with their respective attributes and to ask them their preferred choice (cf. figure 45). Furthermore, "it was found that response rates and expressed willingness to contribute were significantly higher when the contribution was hypothetical than when "expressed willingness" meant an immediate cash contribution" (Arrow 1993, p.8). According to the literature, it could have been more relevant to remind people before asking the WTP question their budget and economic constraints and that their contribution will reduce as much their possible donation to other environmental project(s) or their personal expenses. As the NOAA panel pointed out "[the respondents] may respond without thinking carefully about how much disposable income they have available to allocate to all causes, public and private" (Arrow 1993, p.14). In addition, respondents can perceive their given WTP for the programme as a "warm glow"[13], i.e. charitable contributions as seen in Takeshita (undated). It can have two consequences: (1) the moral satisfaction may exaggerate "real" WTP (Arrow 1993, p.8), (2) the responses distribution to WTP can be characterised by a significant proportion of "zeros" because according to Arrow (1993, p. 17) "most of us give nothing to most charities". It can also be that respondents are solicited too often to make charitable contributions. It is important not to reach their acceptance rate. Moreover, I asked respondents their WTP for the creation and the maintenance of the cycling and walking path. It could have been interesting to compare the WTP for only the maintenance with the WTP for the creation and maintenance of the path. We suppose that the WTP for the maintenance would not have been much lower than the WTP for the creation and maintenance of the path. Secondly, we should have

[13] "Moral satisfaction is said to be one of the warm glow of giving. Warm glow is the value given to the impure altruistic preference […]. It should be noted that the definition of warm glow is different from pure altruistic preference (where pure altruistic preference makes the respondents pay tax or donation only for the purpose of increasing the total supply quantity of environmental goods in the society)" (Takeshita undated).

asked people if they agree with the payment vehicle used in the valuation exercise. We suppose that respondents may not be ready to pay if they don't agree with the payment vehicle. Indeed, few respondents justified their refusal to pay by the following reasons: "we are already paying too much tax". Apart from this, as recommended in the NOAA report, we asked respondents to specify the reasons for their unwillingness to pay (Contingent valuation method) and to indicate the reasons for their choices (Choice modelling method). We could have asked them why they are willing to pay the chosen amount of money.

➢ *Choice modelling:* We need here to highlight that the Choice modelling method has not been correctly implemented. Indeed, we have developed three scenarios, but instead of showing the different scenarios with their respective attributes, on the pattern of figure 45, we developed a set of handmade sketches. We should have presented both documents during the interviews. In comparison to the contingent valuation method, choice modelling method allows us to vary the levels of attribute between each scenario, to evaluate the value of each attribute individually and to calculate the crossing effects between several attributes. The price of the scenarios is only considered as one of secondary attributes (Pappalardo 2010, p.28).

Figure 45: Which scenario do you prefer (you should take into account the yearly financial contributions)?

	***Natural plant cover* = status quo**	***Barren path* scenario**	**Structured plant cover**
Degree of transparency and luminosity	Medium (less abundant vegetation)	High (no vegetation)	Low (abundant vegetation)
Structure of green space	Unstructured (natural)	Barren	Structured
Safety and security of the GI	Medium (Lighting and closing time of the path and park at nightfall)	Low (No particular measures)	High (Lighting, video surveillance camera, path and park closed at nightfall…)
Maintenance of the GI	Medium	Low	High
Cost	25 € per year	15€ per year	35 € per year
Choice	1 ☐	2 ☐	3 ☐

Source: SEGEFA-ULg, 2012.

2.2.3.2.3 What are the lessons to be learned from this study?

- *Face-to-face interviews versus focus group:* We undertook a stated preference analysis to estimate the economic valuation of environmental services. We conducted both a contingent valuation and a choice modelling analysis to improve the quality of the results. The face-to-face interviews involved handmade presentations of different scenarios and random respondents were asked to state their willingness to pay for each scenario and to choose their preferred scenario. The advantage of individual interview is that respondents were not influenced by what their peers might say as might have been expected in the case of focus groups. The basic postulate is that both methods should yield complementary results.
- *Location of people responding to the surveys:* We have conducted interviews at the city scale to complete the first series of interviews administered at the district scale. Indeed, the cycling and walking path defined in the framework of VALUE has a mainly local influence. We could have interviewed the potential users living or working more than 150 m radius from the river Vesdre or the businesses located within a 150 m radius. To validate the results of the first interviews, several other interviews were conducted in the city centre of Verviers in December 2011 / January 2012. The first survey showed the unprofitability of the creation of the new path at the scale of the case study area. However, the second survey demonstrated the profitability of the project on a larger scale, i.e. the scale of the city of Verviers. It is important to mention here, that although methodological quality of the method has been improved, we did not make major changes on the questionnaire for the second survey. One improvement was to present the localization of the path on a smaller scale (see visual aids in appendix 5.4). Indeed, the main aim of conducting a second survey was to compare the results of the two surveys.
- *Evaluating the economic impact:* The study does not allow us to evaluate the economic impact through more complex channels (to give up your second car, to go by bike, the tendency to renovate your house, the supra-local interest…).
- *Location of the section*: The study pointed out the problem of location. It would have been better to study one site of the river Vesdre nearer the city centre (see figure 2 above).
- *Urban planner work:* This study has its interest in the work of urban planners if the study takes place before making the decision of which development will be suggested.

3 TOP-DOWN APPROACH: MULTIPLIER ANALYSIS

3.1 Methodology

The objective of this part is to evaluate all internal economic impacts of particular investments through Multiplier Analysis linked to the Type 1.2 'Input/Output' Analysis. We have followed the method proposed by Verspecht (2010, p.13) for conducting the input-output study. The main steps are:

- "Allocate all costs and benefits from CBA to specific economic sectors;
- Draw up the input-output table at regional level [for the concerned sectors];
- Estimate the output multiplier for the given sectors at regional level (on the basis of the input-output analysis);
- Apply the multiplier to the green investment".

3.1.1 Allocate all costs and benefits from CBA to specific economic sectors

In the first instance we have measured all costs and benefits. We have collected all data concerning the costs and benefits of CBA with the help of different departments from the University of Liège, the Economic Development Agency for the Province of Liège and the Verviers municipality.

3.1.1.1 Matrix representation of costs and benefits of development scenarios

We developed a matrix representation of benefits and costs for each development scenario (see tables 53 and 54 below). The objective is to present expected benefits and costs of each landscaping projects presented to the respondents using the results of stakeholders' interviews, focus groups and face-to-face interviews. 7 main benefits have been identified: green mobility, tourism, employment, sources of revenue, district life, education, health and well-being. The 5 main costs arise from establishment and materials, and are discussed under the heading investment, maintenance, surveillance and education.

Table 53: Matrix representation of benefits of development scenarios

	Natural vegetation cover	*Barren path* scenario	*Structured plant cover*	Direct or indirect benefits
Green mobility:				
- Quick short-distance travel;	X	X	X	Direct
- Foster user health and well-being;	X	X	X	
- Reduce carbon footprint of the city.	X	X	X	
Tourism:				
- Network of greenways connecting the different neighborhoods;	X	X	X	
- Promotion of the pedestrian and cycle paths;	X	X	X	
- Discovery by the users of aquatic plants and plants living in the transition zone between water and land;	X			Direct
- Discovery by the users of seasonal plants;	X		X	
- Increase in tourist visits.	X	X	X	
Employment:				
- Job creation for the maintenance of the river Vesdre and the pedestrian and cycle paths;	X	X	X	Indirect
- Job creation for the physical surveillance of the path by security officers.	X	X	X	
Sources of revenue:				
- Fining in case of drinking alcohol in the street/ or throwing litter, chewing-gum or paper on the ground;	X	X	X	
- Fining in case of vandalization of the plants;	X		X	
- Increase of tourism receipts.	X	X	X	
District life:				
- District stimulation;	X	X	X	
- Shortcut to the city centre.	X	X	X	
Education:				
- Information sessions for children and young people of nearby schools;	X	X	X	
- Educational opportunity for all ages.	X		X	
Health and well-being:				Direct
- Fostering individual health and well-being.	x	x	x	

Source: SEGEFA-ULg, 2011.

Table 54: Matrix representation of costs of development scenarios

	Natural plant cover	*Barren path* scenario	*Structured plant cover*	Direct or indirect benefits
Implantation:				
- planning;	X	X	X	
- site preparation;	X	X	X	
- creation of the infrastructure:				
✓ terrace overhanging the river,	X	X	X	Direct
✓ banister,	X	X	X	
✓ footbridges,	X	X	X	
✓ railing,	X	X	X	
✓ stairs / traverses,	X	X	X	
✓ plantation.	X		X	
Materials:				
- terrace: wood, metallic structure;	X		X	
- terrace: stone;		X		
- banister of 5%: wood, nonskid, metallic structure;	X		X	
- banister of 5%: concrete, metallic structure;		X		
- footbridges: wood;	X		X	
- footbridges: concrete;		X		
- railing: metallic structure;	X	X	X	Direct
- stairs / traverses: wood, gravel;	X		X	
- stairs / traverses: concrete, gravel;		X		
- *natural plant cover*: aquatic plants and semi-aquatic plants;	X			
- *structured plant cover*: rosewood, perennial flowering plants, seasonal flowering plants;			X	
- *barren path* scenario: gravel;		X		
- plantation Marie-Henriette's park: trees and schrubs.			X	
Maintenance:				
- weeding;	X		X	
- tree maintenance - Marie-Henriette's park;	X	X	X	
- removal of dead and dying trees - Marie-Henriette's park;	X	X	X	
- protection against destructive animals and clipping of shrubs and trees;	X		X	Direct
- garbage, debris and trash collection in the Vesdre's channel and on the bicycle/pedestrian path;	X	X	X	
- bin and "dog bin" collection and filling the dispenser with plastic bags for collecting dog feces or litter.	X	X	X	
Surveillance:				
- night lighting;	X	X	X	
- video surveillance;	X	X	X	
- police or security patrols;	X	X	X	
- fines in case of non-compliance to law.	X	X	X	
Education:				
- information sessions for children and young people from nearby schools.	X	X	X	

Source: SEGEFA-ULg, 2011.

3.1.1.2 Direct costs

3.1.1.2.1 Investment costs

The total investment costs are shown in Table 55. These costs are based on the estimated quotation asked by the Economic Development Agency for the Province of Liège to the engineering consultants group Arcadis[14], which is "an international company that provides consultancy, design, engineering and management services in the fields of Infrastructure, Water, Environment and Buildings" (Arcadis website; 2012). The investment costs are composed of establishment and materials costs. These figures are by consequent subject to change.

Table 55: Estimated investment costs in EUR and % of the total cost

Terrace of the "Grandes Rames" street	**€**	**% of total**
Earthworks	**18.950,00**	11,35
Concrete works	**17.162,50**	10,28
Metallic building	**15.300,00**	9,16
Coating and various tasks	**25.650,00**	15,36
Terrace of the "Marie-Henriette" Parc		
Earthworks	**19.762,50**	11,84
Concrete works	**21.725,00**	13,01
Metallic building	**31.175,00**	18,67
Coating and various tasks	**17.250,00**	10,33
Total (2 Terraces)	**166.975,00**	
VAT	**35.064,75**	
Total VAT	**202.039,75**	

Source: Adapted from the estimated quotation of Arcadis, 2011.

According to these figures, we can see that the metallic building of the terrace in the "Marie-Henriette's" Park will be larger and therefore more expensive that the terrace in the "Grandes-Rames" street.

3.1.1.2.2 Maintenance costs

To estimate the maintenance costs of the terraces and of the bicycle/pedestrian path, we have based our estimation on the approximate costs given by the Urban and Territorial Development Department of Verviers city council.

3.1.1.3 Direct benefits

The benefits are not always monetarized.

[14] Arcadis. Extracted from http://www.arcadis.com/About_Us.aspx on 28.02.2012.

3.1.1.3.1 Shortcut from home to the public services and city centre

The path could be seen as a shortcut between the homes located on the right bank of the river Vesdre and the city centre. Secondly, it could be a shortcut between the homes located on the right bank of the river Vesdre and the "Saint Michel's" School (Rue Hombiet, 1) and/or "La Page" (Rue Hombiet, 9), which offers the following services: prevention service, youth aide service, homework school and community space.

3.1.1.3.2 Recreational use

We understand by recreational use, the use of the path for recreational and social activities, for example for recreational cycling and walking activities, for meeting people, and as a shortcut to the "Marie-Henriette" park. According to the official statistics, 6% of the population living in Mamelon Vert + Prés-javais + Saint-Remacle declare owning a bicycle and 5% for Verviers in a whole (see table 10, p.19).

At local scale, we suppose that the bicycle/pedestrian path financed by the VALUE project is an extension of the "Récollets" path. The bikeable path will be bigger, which will increase the number of people. If we think on a bigger scale, the 13 sections of the future path alongside the Vesdre could be part of the strategy aiming to link the different greenways, located nearby the Vesdre such as the line 38 or the path named "le chemin des Echaliers".

We would like to highlight that the creation of the new path will include the revitalization of the park Marie-Henriette. The park is composed of trees, located on the way namely along the river Vesdre, grass, open space, benches and play equipment. It is planned to improve the grass and tree plantations. Many respondents proposed to volunteer for cleaning up the river bank and for removing graffiti, painting and cleaning play equipment.

Green mobility is today globally understood as being an important issue. It follows that we can assume that promoting the creation of the cycling and walking path could help the residents to take the opportunity to use the path as a "recreation trail" or as a shortcut between home and city centre or workplace.

3.1.1.3.3 Tourism

Tourism is another sector which could be impacted by the creation of the path. As we already mentioned, this path should be seen as a small part of the green cycle belt following the river Vesdre from Pepinster to Limbourg and aiming to offer a "recreation trail" linked to the Route of the Fountaine, the Wool and fashion centre, and other tourist attractions.

As Allin (2009, p. 7) mentioned "the open spaces and the greenery are part of the elements influencing the neighbourhood quality". To measure the neighbourhood quality, Verspecht (2010, p.37) highlighted the fact that the property price could be an indicator. To develop this indicator, the tool that could be used is the hedonistic pricing method, which is a revealed method "based on the hypothesis that the value indicators such as the property prices reflect the spatial variations of the public goods attributes of different communities" (Allin, 2009, p. 6).

We have not measured the quality of the living environment by using the hedonistic pricing method because the data were not available. The quality of life was studied and measured on a larger scale by the Institut für Landes- und Stadtentwicklungsforschung gGmbH.

3.1.1.3.4 Health effects of cycling or walking

The health effects of doing sports are multiple. As Verspecht (2009, p.39) said “directly or indirectly, sufficient physical exercise reduces the risk of heart and vascular disease, high blood pressure, diabetes and psychological problems.” The creation of the path could encourage people to practice sports activities on a regular basis (walking, cycling, jogging, etc…).

3.1.1.4 Indirect costs and benefits

According to Verspecht (2009, p.69), “the effect of the land use plan on the local economy can be calculated through a multiplier analysis.” The idea is that the green infrastructure investment will have an impact on other economic activities in and around Verviers. To measure this impact, we need beforehand to determine indirect costs and benefits. As Verspecht mentioned in her report (2009, p.70), indirect benefits can be divided into two classes:

- The creation and maintenance of the green infrastructure investment may imply the hiring of extra workforce. More money will be therefore spent in the local economy. We can assess these by using an employment indicator.
- Another indirect benefit will be the growth of production in the sectors related to the creation of the green infrastructure (Verspecht, 2009, p.69). The output multiplier, which will be calculated from the input-output table, aims to assess the production growth.

For the cycling and walking path along the river Vesdre, we will focus on the growth of production, because no extra workforce has been hired in Verviers for this project.

The investments should include the pedestrian and bicycle path and two terraces. However, as explained above under point 1.3.3, the Economic Development Agency for the Province of Liège only has available funding for the building of one terrace. Nevertheless, the engineering consultants group Arcadis/Hennequin has made an estimated quotation for two terraces. As a result, we will pursue the input-output analysis for the building of two terraces.

As Keskin et al. (2011, p.21) mentioned “green infrastructure investments cannot be classified directly under any specific industry”. We should take into account several classifications to get the whole amount of expenditure of the VALUE project.

Table 56 presents a description of the sectors selected with the help of the Development Agency for the Province of Liege.

Table 56: Description of the selected sectors

Code	Category	Sub-Code	Description
20	Woodworking products	20A1	Woodworking and manufacture of articles made of wood and cork, wicker wood or esparto wood
24	Chemical products	24A1	Chemical industry
		24C1	Manufacture of paints, varnishes and printing ink
		24E1	Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations
		24F1+ 24G1	Manufacture of other chemical products, artificial and synthetic fibers
26	Other nonmetallic mineral products	26B1+ 26D1	Manufacture of ceramic products, of articles of concrete, plaster and cement; cutting, shaping and finishing of ornamental and building stone; manufacture of other non-metallic mineral products
		26C1	Manufacture of cement, lime and plaster
27	Ferro-alloy products	27A1	Manufacture of ferro-alloys and of tubes
28	Metallurgic products	28B1	Treatment and coating of metals; general mechanical engineering
45	Building work	45A1	Preparing the ground
		45B1	General construction and civil-technical works
		45C1	Construction of permanent paths, roadways, landing strips and sports installations, hydraulic engineering and other construction works.
		45D1	Installation work activities
		45E1	Finishing and equipping of constructions, hire of machinery for the construction industry (with operators)
71	Renting without operators	71B1	Renting of other machinery and equipment; renting of personal and household goods
90	Sewerage, public roads and waste management	90A1	Sewerage, market refuse collection and waste management
		P31	Personal consumption Expenditures
		P51	Gross Private Domestic Investment
		P32	Govt. Purchases of Goods & Services
		P6	Net Exports of Goods & Services

Source: Adapted from the Federal Planning Bureau, 2011.

3.1.2 Draw up the input-output table at regional level and calculate the total impact

After having determined all costs and benefits from CBA to specific economic sectors, we have drawn up the input-output table at regional level, namely the Wallonia region of Belgium. A monetary input-output table reflects the relationship between the output of the different sectors of activity and the relationships with the other regions of Belgium and with the foreign countries (Avonds, 2008, p.1).

The Federal Planning Bureau gave us the most recent version of Input-Output table from 2003 and Leontief Inverse Coefficient from 2003 by field of activity at regional level. We selected the sectors concerned (see table 56) and built an input-output table on the following model (see table 57).

Table 57: Structure of an input-output table

		PRODUCERS AS CONSUMERS														FINAL DEMAND			
FIELD OF ACTIVITY		20A1	24A1	24C1	24E1	24F1+ 24G1	26B1+ 26D1	26C1	27A1	28B1	45A1	45B1	45D1	45E1	71B1	90A3	P31	P51	P32	P6
PRODUCERS	20A1																			
	24A1																			
	24C1																			
	24E1																			
	24F1+ 24G1																			
	26B1+ 26D1																			
	26C1																			
	27A1																			
	28B1																			
	45A1																			
	45B1																			
	45D1																			
	45E1																			
	71B1																			
	90A3																			
VALUE ADDED		Employee compensation															GROSS DOMESTIC PRODUCT			
		Profit-type income and capital consumption allowances																		
		Indirect business taxes																		

Source: SEGEFA-ULg, 2011. Adapted from Miller (2009, p. 3) and Federal Planning Bureau, 2011.

The Local Quotient is “a tool for measuring spatial concentration” (Keskin et al., 2011, p.22). The Leontief Inverse Coefficient that the Federal Planning Bureau gave us is at regional scale. Therefore, we do not need to calculate the local quotient to capture the geographical impact.

3.1.3 Estimate the output multiplier for the given sectors at regional level (on the basis of the input-output analysis)

The impact on the local economy of the money that flows into a local economy can be analysed through the local multiplier (Sacks, 2002, p.16). The multiplier is an indicator, namely a ratio between cumulated effects (direct plus indirect) and direct effects. It represents a relative measurement scale showing in which way the indirect effects are increasing when the indirect effects relating to interactions with suppliers are taking into account. According to the traditional input-output model of Leontief, the direct effect corresponds to the final demand addressing the domestic production. The cumulated effect consists of the addition of the direct and inferred effects at all levels of the production process, which are necessary for meeting the final demand (Planweb, 2011, p. 1).

The multiplier is calculated through input-output analysis. There are two types of linkage effects which can be measured by input-output analysis and which result in a multiplier.

- Multiplier I: Indirect effects count the multiple rounds of inter-industry purchases needed.
- Multiplier II: Induced effects capture the impact of household spending.

The multiplier implies to measure several rounds of spending. We will measure the first two or three rounds of spending. For the first round, we need to find out the income of our organisations. Then, for the second round, we need to determine how much contractors, people and organisation receiving the spending have spent locally. The third round concerns suppliers and local staff and how they re-spent the local spending. After having collected all data, we will add the figure of all three rounds together, divide the result by the initial income and the answer will be the local multiplier score for three rounds.

For building this indicator, we use the alternative 1 described in the report written by Keskin, Henneberry and Mell called “Estimating the Impact of Individual Green Investments on the Sheffield and Manchester Economies: Input-Output and Local Multiplier Analyses”.

3.2 Results and discussion

3.2.1 Results

3.2.1.1 Identification of indirect costs and benefits of *natural plant cover* scenario

Table 58: Matrix of Inverse Coefficients

(Product by Product Walloon Region Input-Output Analytical Tables (2003))

Product		20 Wood-working products	24 Chemical products	26 Other nonmetallic mineral products	27 Ferro-alloy products	28 Metallurgic products	45 Building work	71 Renting without operators	90 Sewerage, public roads and waste management	Total
20	Woodworking products	*1.0992*	*0.0021*	*0.0037*	*0.0016*	*0.0021*	*0.0231*	*0.001*	*0.002*	1.1348
24	Chemical products	*0.0375*	*1.0751*	*0.0196*	*0.0169*	*0.0219*	*0.0168*	*0.0055*	*0.0348*	1.2281
26	Other nonmetallic mineral products	*0.0119*	*0.0064*	*1.0656*	*0.0166*	*0.0079*	*0.0753*	*0.0023*	*0.0076*	1.1936
27	Ferro-alloy products	*0.0041*	*0.0047*	*0.0161*	*1.1391*	*0.0928*	*0.0291*	*0.0022*	*0.0043*	1.2924
28	Metallurgic products	*0.0099*	*0.0059*	*0.0281*	*0.0782*	*1.1006*	*0.0524*	*0.004*	*0.0098*	1.2889
45	Building work	*0.0276*	*0.0392*	*0.0294*	*0.0444*	*0.0341*	*1.2811*	*0.0189*	*0.0887*	1.5634
71	Renting without operators	*0.0074*	*0.006*	*0.014*	*0.0072*	*0.008*	*0.0097*	*1.0353*	*0.0275*	1.1151
90	Sewerage, public roads and waste management	*0.0053*	*0.0072*	*0.0062*	*0.0065*	*0.0045*	*0.0077*	*0.0051*	*1.2124*	1.2549
	Total	1.2028	1.1466	1.1827	1.3105	1.2718	1.4952	1.0742	1.3872	10.071

Source: Input-Output Regional Data developed by the Federal Planning Bureau in the context of the "Flemish Environment-Input-Output Model" project commissioned by the Flemish Region, 2011.

The Federal Planning Bureau supply "inverse coefficient" data at the regional scale. Given that it is a regional scale coefficient, we therefore don't need to calculate the location quotient in order to capture the geographical impact.

The green infrastructure investment in Verviers is still in progress. From the overall Master Plan of the cycle and pedestrian path (see figure 4, p. 14), only two terraces will be built. The budget information is only available for the two terraces. The projected budget breakdown and Leontief Inverse Coefficient are described in table 59.

Table 59: Application of Input-Output Analysis to Verviers

Product		Leontief Inverse Coefficient	Budget	Local Quotient	Total Impact
20	Woodworking products	1.1348	21,250.00 €	-	24,114.50 €
24	Chemical products	1.2281	-	-	
26	Other nonmetallic mineral products	1.1936	40,887.50 €	-	48,803.32 €
27	Ferro-alloy products	1.2924	-	-	
28	Metallurgic products	1.2889	-	-	
45	Building work	1.5634	95,787.50 €	-	149,754.18 €
71	Renting without operators	1.1151	5,950.00 €	-	6,634.85 €
90	Sewerage, public roads and waste management	1.2549	3,100.00 €	-	3,890.19 €
	Total		166,975.00 €		233,197.03 €

Source: SEGEFA-ULg, 2011. Adapted from Federal Planning Bureau, 2011 and Arcadis, 2011

$$= \frac{\sum [(21{,}250.00\,€ * 1.1348) + (40{,}887.50\,€ * 1.1936) + (95{,}787.50\,€ * 1.5634) + (5{,}950.00\,€ * 1.1151) + (3{,}100.00\,€ * 1.2549)}{166{,}975.00\,€}$$

$$= \frac{233{,}197.03\,€}{166{,}975.00\,€}$$

$$= 1.397$$

According to the calculation, every euro spent on the VALUE investment generates approximately EUR 1.40 for the regional economy or an additional EUR 0.40.

3.2.1.2 Calculating the Multiplier Effect

USE OF THE ALTERNATIVE 1

Round/step 1: *What is the project's turnover?*

The information concerning the budget breakdown of the VALUE project has been collected from the Economic Development Agency for the Province of Liege (see table 60 below).

Round 1: EUR 270,537.45

Table 60: Budget breakdown of the VALUE project in Verviers

Budget Breakdown	Local labour	Local material	Total
Administration / Coordination	€7,630.00	€0.00	€7,630.00
Planning and design	€53,512.00	€0.00	€53,512.00
Construction	€86,877.09	€115,162.66	€202,039.75
Sub-total	***€148,019.09***	***€115,162.66***	***€263,181.75***
Information sessions	€750.00	€3,945.70	€4,695.70
Maintenance costs	€2,660.00	€0.00	€2,660.00
Total	€151,429.09	€119,108.36	***€270,537.45***

Source: Economic Development Agency for the Province of Liege, 2011.

Round/step 2: *How does the organisation spend its project budget locally?*

Index BT01 is a French building price index, which gives information about cost development in the building sector. It is composed as follows: 43% for salaries and expenses, 32% for materials, 4% equipment, 3% for transport costs, 3% for energy and 15% for miscellaneous expenses. We have used these weighting coefficients to obtain the cost breakdown of the construction budget (see table 61 below).

Round 2: (total local labour) + (local material)

Round 2: EUR 148,019.09 (total local labour) + EUR 115,162.66 (local material)

Round 2: EUR 263,181.75

Table 61: Weighting coefficients

Budget Breakdown - Construction	Weighting Coefficient	Cost Breakdown
Index BT01		
Salaries and expenses	43%	€86,877.09
Materials	32%	€64,652.72
Equipment	4%	€8,081.59
Transport costs	3%	€6,061.19
Energy	3%	€6,061.19
Miscellaneous expenses	15%	€30,305.96
Total Construction	100%	€202,039.75

Source: Les indicateurs de l'immobilier, Net-iris, 2012.[15]

[15] Les indicateurs de l'immobilier. Extracted from http://www.net-iris.fr/indices-taux/immobilier/31-index-bt01-indice-national-batiment-bt-01 on 28.02.2012.

Round/step 3: *How much of their income do the staff/suppliers spend locally?*
We Use Household expenses for the Walloon Region from the Household Budget Survey (2009), FPS Economy.

Round 3: EUR 148,019.09 * 82.22%= EUR 121,701.84

Expenditures such as large domestic appliances, therapeutic equipment, car buying, expenditure on HORECA, package holidays and holiday spending, other services and no stated consumption are excluded from the calculation. We suppose that they are bought outside the sphere of influence of the local economy.

Local Multiplier Analysis formula:

$$LM = \frac{Round1 + Round2 + Round3}{Round1}$$

$$= \frac{270{,}537.45 + 263{,}181.75 + 121{,}701.84}{270{,}537.45} = \frac{655{,}421.04}{270{,}537.45} = \textbf{EUR 2.42}$$

For every Euro spent on the VALUE investment, EUR 2.42 is generated for the local economy or an additional EUR 1.42.

3.2.2 Discussion

As Keskin et al. mentioned in their report (2011, p.42), "the input-output technique is used to analyse changes in final demand and their effect on output, employment and income in an area" (Keskin et al., 2011, p.42). We carried out an input-output analysis of the green infrastructure investment in Verviers from the latest version of the Input-Output table that was available. The Plan Federal Bureau kindly supplied the data from 2003. According to the input-output analysis, we can conclude that every euro spent on the VALUE investment generates approximately EUR 1.40 for the regional economy or an additional EUR 0.40.

The Local Multiplier Analysis aims to calculate the project economic contribution to the local economy. It examines the project initial income and analyses how the initial income will be spent on the different budget lines and then how the local residents and businesses will re-spend their money on local economy. We added the three rounds of spending together and divided the sum by the initial investment. According to this method, for every Euro spent on the VALUE investment, EUR 2.42 is generated for the local economy.

4 CONCLUSION

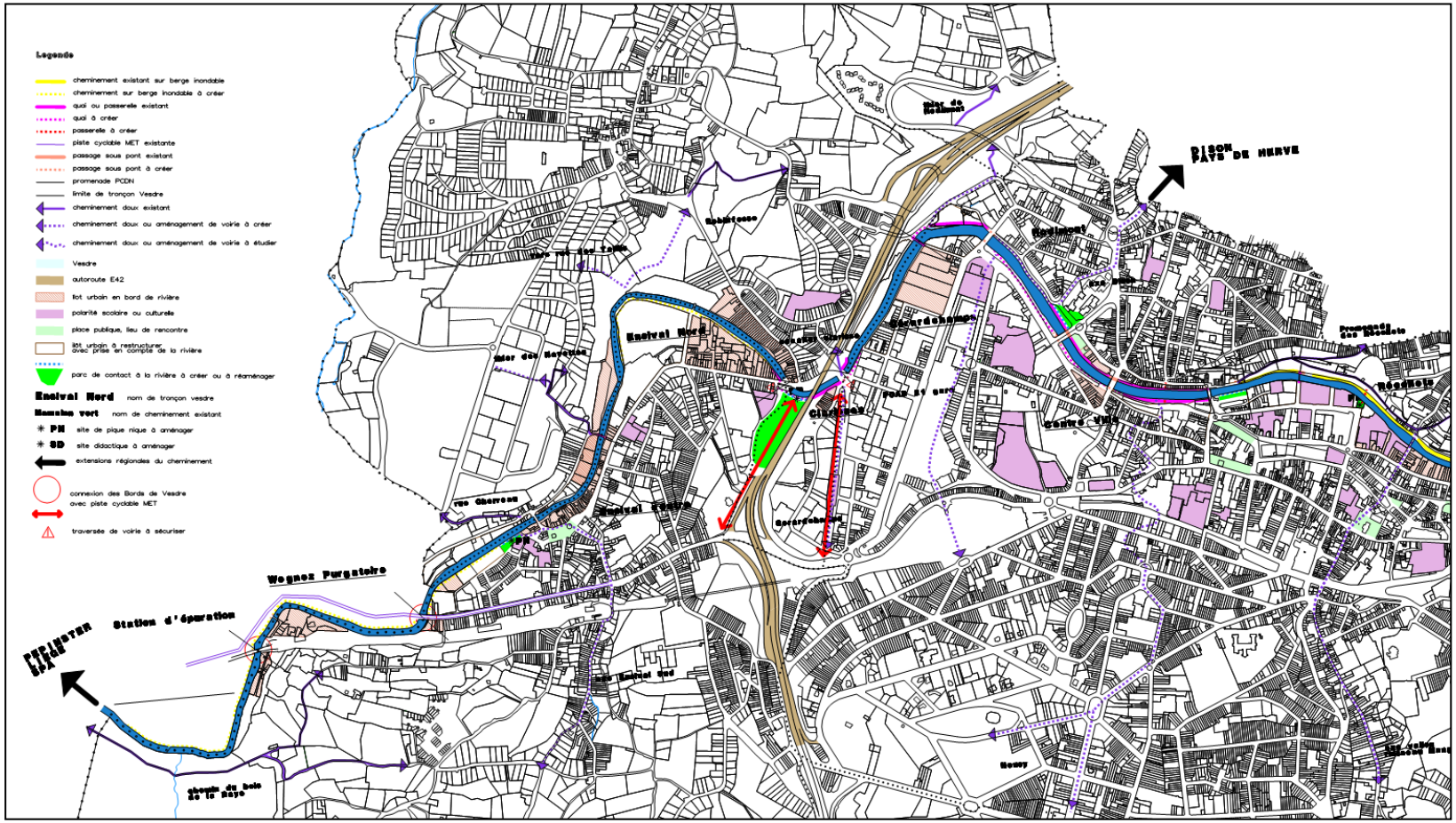
This report aims to analyse the results of the economic valuation of non-market benefits of constructing and maintaining a cycling and walking path along the river Vesdre in Verviers. The objective is to answer the question: Under what conditions are the enhancement and creation of green investment a sustainable investment? The answer to the research question will help the developer to determine if this type of infrastructure, which offers a low level of functionality, should be supported. We apply two types of economic valuation test at two different scales, namely:
(i) 'TYPE I' valuations: top-down – city/region scale (common test by all city/regions); and
(ii) 'TYPE II' valuations: bottom-up – site/neighbourhood scale (complementary tests).
For the 'TYPE II' valuations, we proposed to apply the contingent valuation approach combined with the choice modelling approach, which are two stated preference techniques. We carried out two surveys in order to determine how much the residents were willing to pay for the creation and maintenance of the path, and which development scenario between the natural plant cover *(initial situation)*, the structured vegetation, and the barren path, they would prefer. Moreover, we presented the "Récollets" path to the respondents in order to analyse their practices. We compared the interest of the respondents for the cycling and walking path with their effective and passive use of the "Récollets" path. The purpose was to collect data on the expectations of the inhabitants with regard to the green infrastructure, to give the respondents the opportunity to express their views concerning the quality of neighbourhood, the quality of open spaces, and their satisfaction with neighbourhood quality. The questionnaire results inform planning officers and developers on the support of the inhabitants, and to inhibit possible conflicts. We can conclude that residents and communities do support the development of green infrastructure. In the first survey, the results show that the residents prefer the structured vegetation to other scenarios but they are not willing to pay for the natural plant cover. However, in the second survey, the results illustrate the strong preference of the residents for the natural plant cover. The analysis of the residents' WTP shows that in terms of economic utility the current project seems not to be profitable for the residents at the scale of the study area. Nevertheless, if we change the scale factor to, say, the city of Verviers, the current project appears to be profitable. Moreover, in the second survey, residents mentioned their interest in getting involved in the maintenance of the path by volunteering for keeping the path clean. It could have been interesting to focus one part of the survey to volunteering practices of the residents. It would measure the involvement of the residents not only in material terms, but also in terms of time. We think that the time involvement of the residents in their neighbourhood shows as much their support for the project as their "willingness to pay".

For the 'TYPE I' valuations, we carried out an input-output analysis and applied a local multiplier. The objective of the evaluation is to analyse the economic impact of green investment. According to the input-output analysis, we can conclude that every euro spent on the VALUE investment generates approximately EUR 1.40 for the regional economy or an additional EUR 0.40. The multiplier analysis shows that for every Euro spent on the VALUE investment EUR 2.42 is generated for the local economy. We can conclude that the difference between the I-O based analysis (EUR 1.40) and the

local multiplier (EUR 2.42) is the consequence of the more detailed information obtained from the Economic Development Agency of Province of Liège and Verviers City Council.

5 APPENDICES

5.1 City Centre Masterplan



5.2 Introduction letter

5.2.1 Original version

Université de Liège - SEGEFA
Allée du 6 Août, 2 – B11
Sart Tilman – 4000 Liège
Tél. : +32 4 366 52 64
Mail : christelle.viaud-mouclier@ulg.ac.be

Liège, le 03 janvier 2010

Mesdames, Messieurs,

Concerne : Investissements en espaces verts à Verviers

La Ville de Verviers étudie actuellement un projet d'aménagement des bords de Vesdre.

Dans ce cadre, l'université de Liège mène une recherche sur l'évaluation de l'attractivité des espaces verts.

Nous souhaiterions connaître votre point de vue sur les espaces verts existants, les futurs investissements et sur les bénéfices potentiels pour votre quartier et pour Verviers.

Je me présenterai par conséquent à votre domicile entre le 03 et le 31 janvier 2010. Je sollicite votre gentillesse pour m'accorder un peu de votre temps en vue de collecter vos réponses.

Votre participation est volontaire. Lors de l'entretien, vous serez libre de vous retirer à tout moment sans donner de raison et sans aucune conséquence négative. De plus, si vous ne souhaitez pas répondre à certaines questions, vous êtes libre de ne pas y répondre. Il va de soi que l'usage de vos réponses se fera dans un cadre purement scientifique et dans la plus grande confidentialité. Elles ne seront pas divulguées à des tiers pour une autre utilisation. Aucune information personnelle ne sera divulguée.

Nous vous remercions d'avance pour votre participation et pour l'intérêt que vous portez au développement de votre quartier.

Dans l'attente de vous rencontrer, veuillez agréer, Mesdames, Messieurs, mes meilleurs sentiments.

Christelle Viaud-Mouclier
Attachée de recherche

5.2.2 Translated version

University of Liege - SEGEFA
Allée du 6 Août, 2 – B11
Sart Tilman – 4000 Liège
Tel. : +32 4 366 52 64
E-Mail : christelle.viaud-mouclier@ulg.ac.be

Liege, January 3rd, 2011

Object: Investments in green spaces in Verviers

Dear Sir or Madam,
The city of Verviers is currently studying a landscaping project of the banks of the Vesdre.
For this reason, the University of Liege is carrying out a study on valuation of attractiveness of green spaces.
We would like to know your point of view concerning the existing green spaces, future investments and potential advantages for your district area and for Verviers.
I will ring your doorbell between January 03rd and 31st, 2011. I wonder if you would be kind enough to give me a little bit of time in order to collect your answers.
Your participation is voluntary. During the interview, you will be free to withdraw at any time without giving a reason, nor suffer any negative effects from doing so. Additionally, you are not forced to answer questions you do not wish to. All the information collected about you during the course of the study will be kept strictly confidential; your data will not be disclosed to a third party for any other use. No personal information will be disclosed, and if will not be possible to identify you in any report or publication.
We thank you in advance for your participation and for your interest in the development of your district.
I look forward to meeting you.
Best regards,

Christelle Viaud-Mouclier
Research Associate at SEGEFA, University of Liege

5.3 Questionnaire

5.3.1 Original version

Questionnaire d'enquête auprès des ménages

Adresse : _____

Date : _____CAPAKEY : _____

Bonjour, je m'appelle _____et je travaille à l'Université de Liège pour la Ville de Verviers.

Premier questionnaire : Nous étudions actuellement un projet d'espaces verts dans votre quartier.
Deuxième questionnaire : Nous étudions actuellement un projet d'espaces verts à proximité du centre de Verviers. Ce projet est la suite de la Promenade des Récollets qui borde la rive nord de la Vesdre entre le pont d'Al Côte et le pont des Récollets ?

Nous souhaiterions connaître votre avis à ce sujet. Accepteriez-vous de m'accorder 15 minutes de votre temps pour répondre au questionnaire ?
Si la personne répond qu'elle n'a pas le temps :
Pourrais-je revenir à un autre moment de la journée ou un autre jour qui vous conviendrait mieux ?
Si la personne accepte, inscrire la date et l'heure du rendez-vous :
Date :_____Heure :_____

Avant de commencer ce questionnaire, je tiens à vous préciser que la plupart des questions que je vais vous poser concernent votre opinion ou vos attitudes, il n'y a donc pas de bonnes ou de mauvaises réponses. Je souhaiterais simplement connaître votre avis.

Si vous n'avez pas de questions concernant le déroulement de cet entretien, je vais commencer.

QUESTIONS D'INTRODUCTION

Q : Deuxième questionnaire : Enquêteur : question fermée, énumérer, une seule réponse possible.

Connaissez-vous la promenade des Récollets qui borde la rive nord de la Vesdre entre le pont d'Al Côte et le pont des Récollets ?

Oui ◯ Non ◯ *(NSP)* ◯

Q1 : Enquêteur : question fermée, énumérer, une seule réponse possible.

Vous arrive-t-il de vous rendre le long de la promenade des Récollets ?

Très souvent (Q3) ◯ Assez souvent (Q3) ◯ Rarement (Q3) ◯ Jamais (Q2) ◯

Q2 : Enquêteur : question ouverte, ne rien suggérer et encoder. Plusieurs réponses possibles.

Pour quelles raisons n'y allez-vous jamais ? _____

_____

Je ne connais pas cette rivière	◯	Je n'y pense pas	◯
Je n'aime pas cette rivière	◯	J'ai mon propre jardin	◯
Pour des raisons de santé	◯	Autres raisons_____	◯
Pour des raisons de sécurité	◯	*(NSP)*	◯
Par manque de temps	◯		

Q3 : Enquêteur : question fermée, énumérer, une seule réponse possible.

A quelle fréquence vous rendez-vous sur la promenade des Récollets ?

Quelques fois par an	◯	Tous les jours	◯
Quelques fois par mois	◯	*(NSP)*	◯
Plusieurs fois par semaine	◯		

Q4 : Enquêteur : question ouverte, ne rien suggérer et encoder. Plusieurs réponses possibles.

La dernière fois que vous êtes allés sur la promenade des Récollets, quelle est l'activité principale que vous avez pratiqué sur place ?

Promenade/randonnée à pied	◯	Activités sportives (vélo)	◯
Promenade du chien	◯	Pèche	◯
Lecture/temps de repos	◯	Autres activités_____	◯
Plaine de jeux pour les enfants	◯	Aucune autre activité	◯
Raccourcis – du lieu d'habitation au lieu de travail	◯	*(NSP)*	◯
Raccourcis – du lieu d'habitation au centre ville	◯		

Q5 : Enquêteur : question fermée, énumérer, une seule réponse possible.

Trouvez-vous qu'il y a des problèmes de propreté sur la promenade des Récollets ?

Tout à fait d'accord	Plutôt d'accord	Plutôt pas d'accord	Pas du tout d'accord	*(NSP)*
◯	◯	◯	◯	◯

Q6 : Enquêteur : question fermée, énumérer, une seule réponse possible.

Des moyens supplémentaires selon vous devraient-ils être mis en place afin d'assurer la propreté de la promenade des Récollets ?

Oui	Non	*(NSP)*
◯	◯	◯

Q7 : Enquêteur : question ouverte, ne rien suggérer, encoder.

Lesquels ?

_____

_____

_____

Q8 : Enquêteur : question fermée, énumérer, une seule réponse possible.

Trouvez-vous qu'il y a des problèmes d'insécurité sur la promenade des Récollets ?

Tout à fait d'accord	Plutôt d'accord	Plutôt pas d'accord	Pas du tout d'accord	*(NSP)*
◯	◯	◯	◯	◯

Q9 : Enquêteur : question fermée, énumérer, une seule réponse possible.

Des moyens supplémentaires selon vous devraient-ils être mis en place afin d'assurer la sécurité sur la promenade des Récollets ?

Oui	Non	*(NSP)*
◯	◯	◯

Q10 : Enquêteur : question fermée, énumérer, une seule réponse possible.

Lesquels ?

Eclairage nocturne	◯
Fermeture de la prmenade à la tombée de la nuit	◯
Caméra de surveillance	◯
Autre_____	◯
Aucun	◯
(NSP)	◯

EXPLICATION DU PROJET

Projet d'aménagement proposé par la Ville :

Le projet d'aménagement proposé par la Ville consiste en la création d'un chemin cyclo-pédestre. Ce chemin sera réalisé en rive gauche de la Vesdre sur le collecteur des eaux usées entre la rue des Grandes Rames et la rue de l'Epargne. La particularité de cet aménagement est la réalisation d'un couvert végétal naturel sur les berges le long du chemin comme le montre le dessin. Ce dessin correspond au pont Louise.

Les bénéfices issus de ce changement sont :

- la création d'un lieu de détente et de repos
- un accès facilité à la rivière
- la possibilité de faire des balades pédestres le long de l'eau et de découvrir ainsi la rivière
- la possibilité de faire des balades à vélo le long de l'eau
- le prolongement en rive droite de la promenade des Récollets
- la possibilité de rejoindre le centre-ville plus rapidement
- un lieu de détente et de repos

Q11 : Enquêteur : question fermée, énumérer, une seule réponse possible.

Seriez-vous tout à fait favorable, plutôt favorable, plutôt pas favorable ou pas du tout favorable à ce projet d'aménagement ?

Tout à fait favorable	Plutôt favorable	Plutôt pas favorable	Pas du tout favorable	(*NSP*)
◯	◯	◯	◯	◯

Q12 : Enquêteur : question fermée, énumérer, une seule réponse possible.

Si ce projet d'aménagement était réalisé, cela vous inciterait-il à vous rendre sur ce site ?

Oui	Non	*(NSP)*
◯	◯	◯

Q13 : Enquêteur : question ouverte, ne rien suggérer et encoder. Plusieurs réponses possibles.

Quelle activité y pratiqueriez-vous ?

Promenade/randonnée à pied	◯	Aucune autre activité	◯
Promenade du chien	◯	*(NSP)*	◯
Lecture/temps de repos	◯		
Plaine de jeux pour les enfants	◯		
Raccourcis – du lieu d'habitation au lieu de travail	◯		
Raccourcis – du lieu d'habitation au centre ville	◯		
Activités sportives (vélo)	◯		
Pèche	◯		
Autres activités_____	◯		

Q : Deuxième questionnaire : Enquêteur : question fermée, énumérer, une seule réponse possible.

Habitez-vous la commune de Verviers ?

Oui ◯ Non ◯

Q14 : Enquêteur : question fermée, énumérer, une seule réponse possible – Question Evaluation Contingente 'CONTINGENT VALUATION'.

Accepteriez-vous de payer 25 euros par an (soit ± 2 euros par mois) de taxe communale pour la réalisation et l'entretien de cet aménagement ?

Oui ◯

Dans ce tableau, jusqu'à quelle somme accepteriez-vous de payer par an de taxe communale pour la réalisation et l'entretien de cet aménagement ? *Réponse* _____

Non ◯

Dans ce tableau, quelle somme accepteriez-vous de payer par an de taxe communale pour la réalisation et l'entretien de cet aménagement ? *Réponse*_____

(NSP/Refus/0 euros) ◯ (Q9)

Q : Deuxième questionnaire :

Si vous habitiez la commune de Verviers, accepteriez-vous de payer 25 euros par an (soit ± 2 euros par mois) de taxe communale pour la réalisation et l'entretien de cet aménagement ?

Oui ◯

Dans ce tableau, jusqu'à quelle somme accepteriez-vous de payer par an de taxe communale pour la réalisation et l'entretien de cet aménagement ? *Réponse* _____

Non ◯

Dans ce tableau, quelle somme accepteriez-vous de payer par an de taxe communale pour la réalisation et l'entretien de cet aménagement ? *Réponse*_____

(NSP/Refus/0 euros) ◯ (Q9)

Q15 : Enquêteur : question ouverte, ne rien suggérer et encoder. Plusieurs réponses possibles.

Pour quelles raisons ne souhaitez-vous pas payer ?

Ce n'est pas à moi de payer ◯
C'est à la commune de payer ◯
Il n'est pas nécessaire de modifier l'état de cette rivière ◯
Mes moyens financiers ne le permettent pas ◯
Je n'ai pas assez d'informations pour me décider ◯
J'ai peur de payer pour les autres ◯
Cela m'empêchera de pratiquer mes activités ◯
Je paye déjà pour pratiquer une activité de loisir ◯
Je ne veux pas que la rivière soit modifiée ◯
Je ne me sens pas concernée ◯
Autres raisons _____ ◯
(NSP) ◯

Q16 : Enquêteur : question fermée, exposer les deux scénarios, une seule réponse possible – Question « Choice Modelling ».

Je vais maintenant vous proposer deux possibilités d'aménagement, pour lesquelles j'aimerais connaître votre position.

Aménagement minéral :
La première possibilité est la réalisation d'un chemin cyclo-pédestre minéral. C'est le même aménagement que présenté précédemment. La différence est le revêtement en gravier sur les berges au lieu du couvert végétal naturel.

Globalement, seriez-vous tout à fait favorable, plutôt favorable, plutôt pas favorable ou pas du tout favorable à ce scénario ?

Tout à fait favorable	Plutôt favorable	Plutôt pas favorable	Pas du tout favorable	*(NSP)*
◯	◯	◯	◯	◯

Sachant que vous seriez prêt à payer _____€ par an à la commune pour la réalisation du chemin cyclo-pédestre agrémentée d'un couvert végétal naturel, quelle contribution financière seriez-vous prêt(e) à verser, par an, en euros, à la commune pour la réalisation et l'entretien de l'aménagement dit minéral ?_____€

Sachant que vous ne souhaitez pas payer pour la réalisation du chemin cyclo-pédestre agrémentée d'un couvert végétal naturel, quelle contribution financière seriez-vous prêt(e) à verser, par an, en euros, à la commune pour la réalisation et l'entretien de l'aménagement dit minéral ?_____€

Aménagement floral :

La deuxième possibilité est la réalisation d'un chemin cyclo-pédestre avec une végétation plus structurée. C'est le même aménagement que présenté précédemment. La différence est l'aménagement floral des berges.

Globalement, seriez-vous tout à fait favorable, plutôt favorable, plutôt pas favorable ou pas du tout favorable à ce scénario ?

Tout à fait favorable ◯ Plutôt favorable ◯ Plutôt pas favorable ◯ Pas du tout favorable ◯ (*NSP*) ◯

Sachant que vous seriez prêt à payer _____€ par an à la commune pour la réalisation du chemin cyclo-pédestre agrémentée d'un couvert végétal naturel, quelle contribution financière seriez-vous prêt(e) à verser, par an, en euros, à la commune pour la réalisation et l'entretien de l'aménagement dit floral ?_____€

Sachant que vous ne souhaitez pas payer pour la réalisation du chemin cyclo-pédestre agrémentée d'un couvert végétal naturel, quelle contribution financière seriez-vous prêt(e) à verser, par an, en euros, à la commune pour la réalisation et l'entretien de l'aménagement dit floral ?_____€

Q17 : Enquêteur : question fermée, énumérer, une seule réponse possible.

Parmi les trois options, laquelle préféreriez-vous ?

Couvert végétal naturel (situation de référence, présenté précédemment) ◯
Aménagement minéral ◯
Aménagement floral ◯

Q18 : Enquêteur : question ouverte, ne rien suggérer et encoder. Plusieurs réponses possibles.

Pourquoi avez-vous choisi cette option ?

_____

_____

_____

_____

Q19 : Enquêteur : question fermée, énumérer, une seule réponse possible.

L'utilisation des photos et des dessins vous ont-ils été utile pour répondre à nos questions ?

Très utile ◯ Moyennement utile ◯ Un peu utile ◯ Pas du tout utile ◯ *(NSP)* ◯

Q20 : Enquêteur : question fermée, énumérer, une seule réponse possible.

Si le parcours cyclo-pédestre le long de la Vesdre était réalisé, vous rendriez-vous le long de la Vesdre plus souvent, autant ou moins souvent ?

Plus souvent	Autant	Moins souvent	*(NSP)*
◯	◯	◯	◯

Q21 : Enquêteur : question ouverte, ne rien suggérer, encoder.

En moyenne, à combien de visites supplémentaires du site (le long de la Vesdre), cela correspondrait-il ?

1 visite supplémentaire par mois ◯
Entre 2 et 4 visites supplémentaires par mois ◯
Plus de 4 visites supplémentaires par mois ◯
(NSP) ◯

Q22 : Enquêteur : question fermée, énumérer, une seule réponse possible.

Fréquentez-vous certains parcs de la ville de Verviers ?

Oui	Non	*(NSP)*
◯ (Q23)	◯	◯

Q23 : Enquêteur : question ouverte, ne rien suggérer, encoder.

Si oui, lesquels ?_____

Parc

Parc de la Tourelle (Hôpital) ◯
Parc de l'Ancien Château des Moines (Stembert) ◯
Parc de l'Harmonie ◯
Parc de la Séroule (Heusy) ◯
Parc Fabiola ◯
Parc d'Ottomont ◯
Parc des Récollets (Récollets) ◯
Parc Marie-Louise (Rue de Limbourg) ◯

Plaine de jeux

Plaine de jeux Ensival (rue Préry) ◯
Plaine de jeux Deru ◯
Plaine jeux Bielmont ◯
La plaine de Rouheid ◯
Plaine de jeux Peltzer (rue de la Concorde) ◯
Plaine Sottais (rue du 1er de Ligne) ◯
Plaine Sauvage (rue Calamine) ◯
Aire de jeux Marie-Louise (parc rue de Limbourg/rue Marie-Henriette) ◯
Pirouette ◯
Plaine Noël Fassotte ◯
Plaine de jeux Tourelles (route de Grand-Rechain) ◯
Plaine de jeux Lentz (après le pont Louise) ◯

Promenade

Promenade des Récollets ◯
Quai Rapsat ◯

Commune

Petit-Rechain ◯
Andrimont ◯
Autres_____ ◯
(NSP) ◯

Q24 : Enquêteur : question fermée, énumérer, une seule réponse possible.

A quelle fréquence visitez-vous ces parcs ?

Quelques fois par an	◯	Tous les jours	◯
Plusieurs fois par mois	◯	*(NSP)*	◯
Quelques fois par semaine	◯		

Q25 : Enquêteur : question fermée, énumérer, une seule réponse possible.

Dans la région, fréquentez-vous des rivières et des espaces verts ?

Oui	Non	*(NSP)*
◯ (Q25)	◯	◯

Q26 : Enquêteur : question ouverte, ne rien suggérer, encoder seulement.

Si oui, lesquels ? _____

Rivière		Bois de Goé	◯
La Vesdre	◯	Bois de Hèvremont	◯
La Meuse	◯	Bois de Jalhay	◯
L'Ourthe	◯	Bois des Princes	◯
La Gileppe (affluent de la Vesdre)	◯	Bois du Moulin	◯
La Helle (affluent de la Vesdre)	◯	Bois des Gattes	◯
La Hoëgne (affluent de la Vesdre)	◯	Bois des Nids d'Aguesses	◯
L'Aisne (affluent de la Meuse)	◯	Bois de Fraipont	◯
L'Amblève (affluent de la Meuse)	◯	Lac de la Gileppe	◯
Espaces verts		Autres_____ _____	◯
Bois de Mariômont	◯	*(NSP)*	◯

Q27 : Enquêteur : question fermée, énumérer, une seule réponse possible.

A quelle fréquence ?_____

Quelques fois par an	◯	Tous les jours	◯
Quelques fois par mois	◯	*(NSP)*	◯
Plusieurs fois par semaine	◯		

Q28 : Enquêteur : question ouverte, ne rien suggérer, encoder seulement.

Quelle activité principale pratiquez-vous dans ces espaces verts ?

Promenade/randonnée à pied	◯	Pèche	◯
Promenade du chien	◯	Autres_____	◯
Lecture/temps de repos	◯	Aucune autre activité	◯
Plaine de jeux pour les enfants	◯	*(NSP)*	◯
Activités sportives (vélo)	◯		

QUESTIONS PERSONNELLES :

Q29 : Enquêteur : question ouverte, ne rien suggérer, encoder seulement.

Puis-je vous demander votre année de naissance ? - 19____

Q30 : ATTENTION : A remplir par l'enquêteur sans poser la question.

Sexe

Masculin ☐

Féminin ☐

Q31 : Enquêteur : question fermée, énumérer, une seule réponse possible.

Etes-vous :

	Oui	Non
Etudiant	☐	☐
Travailleur	☐	☐
Allocation social	☐	☐
Retraité	☐	☐

Q32 : Enquêteur : question fermée, énumérer, une seule réponse possible.

Quel est votre niveau d'étude ?

Primaire ☐

Secondaire inférieur ☐

Secondaire supérieur ☐

Supérieur non universitaire ☐

Supérieur universitaire ☐

Q33 : Enquêteur : question fermée, énumérer, une seule réponse possible.

De combien de personnes se compose votre foyer y compris vous-même ?

1 personne	◯	6 personnes	◯
2 personnes	◯	7 personnes	◯
3 personnes	◯	8 personnes	◯
4 personnes	◯	9 personnes et plus	◯
5 personnes	◯		

Q34 : Enquêteur : question fermée, énumérer, une seule réponse possible.

Combien y a-t-il d'enfants de moins de 15 ans dans votre foyer ?

Aucun enfant	◯	5 enfants	◯
1 enfant	◯	6 enfants	◯
2 enfants	◯	7 enfants	◯
3 enfants	◯	8 enfants	◯
4 enfants	◯	9 enfants et plus	◯

Q35 : Enquêteur : question ouverte, ne rien suggérer, encoder seulement.

De combien de voitures disposez-vous dans votre ménage ? _____

Q36 : Enquêteur : question fermée, énumérer, une seule réponse possible.

Etes-vous propriétaire ou locataire de votre logement ?

Propriétaire ☐

Locataire ☐

Q37 : Enquêteur : question fermée, énumérer, une seule réponse possible.

Nous désirons analyser les résultats de cette étude en fonction des revenus familiaux des personnes que nous avons interrogées. Je vais vous citer une échelle de revenus MENSUELS NETS, pourriez-vous me dire dans quelle tranche vous vous situez.

Moins de 500 €	◯	De 2 500 à 3 000 €	◯
De 500 à 900 €	◯	De 3 000 à 4 000 €	◯
De 900 à 1 500 €	◯	Plus de 4 000 €	◯
De 1 500 à 2 500 €	◯	*(Pas de réponse)*	◯

Q : Deuxième questionnaire : Enquêteur : question fermée, énumérer, une seule réponse possible.

Accepteriez-vous de m'indiquer votre commune de résidence ?

_____

Accepteriez-vous de m'indiquer le nom de votre rue ?

_____

Accepteriez-vous de m'indiquer le numéro ?

_____

5.3.2 Translated version

Survey among the inhabitants of the Prés-Javais district

Address: _____

Date: _____ *CAPAKEY:* _____

Hello, my name is _____, I work at the University of Liege for the city of Verviers.

First survey: We are currently studying a green spaces project in your district.
Second survey: We are currently studying a green spaces project near the city centre of Verviers. This project is a continuation of the bicycle path which runs along the north bank of the river Vesdre between the Al Côte bridge and the « Récollets » bridge.

We would like to know your opinion on this subject. Would you agree to give me 15 minutes of your time to answer the questionnaire?

If the person answers that he/she has no time:
Could I come back at another time today or another day which would suit you better?
If the person agrees, mention the date and time of the appointment:
Date: _____ *Time:* _____

Before beginning this questionnaire, I would like to inform you that the questions you will be asked relate to your opinion and behaviors; there are no right or wrong answers. I would simply like to know your opinion.

If you don't have any question concerning the interview sequences, I shall begin.

INTRODUCTORY QUESTIONS

Q : Second survey : Interviewer: closed question, enumerate, only one answer possible.

Do you know the "Récollets" path which runs along the north bank of the river Vesdre between the Al Côte bridge and the « Récollets » bridge?

Yes ○ No ○ *(Don't know)* ○

Q1: Interviewer: closed question, enumerate, only one answer possible.

Do you occasionally use the "Récollets" path?

Very often (Q3) ○ Often (Q3) ○ Rarely (Q3) ○ Never (Q2/Q11) ○

Q2: Interviewer: open question, do not make any suggestions, simply note the answer. Several answers are possible.

For which reasons do you not go there? _____

_____

I don't know this river	◯	I don't think about it	◯
I don't like this river	◯	I have my own garden	◯
For health reasons	◯	Other reasons: _____	◯
For safety reasons	◯	*(Don't know)*	◯
Lack of time	◯		

Q3: Interviewer: closed question, enumerate, only one answer possible.

How often do you use the "Récollets" path?

Several times a year	◯	Every day	◯
Several times a month	◯	*(Don't know)*	◯
Several times a week	◯		

Q4: Interviewer: open question, do not make any suggestions, simply note the answer. Several answers are possible.

The last time you used the "Récollets" path, what was the main activity you carried out/took part in?

Walking/hiking	◯	Sport activities (biking)	◯
Dog walking	◯	Fishing	◯
Reading/ recreational time	◯	Other activities_____	◯
Playground (children)	◯	No other activity	◯
Shortcut – between home and workplace	◯	*(Don't know)*	◯
Shortcut – between home and city centre	◯		

Q5: Interviewer: closed question, enumerate, only one answer possible.

In your opinion, are there cleanliness problems on the "Récollets" path?

Strongly agree	Agree	Disagree	Strongly disagree	*(Don't know)*
◯	◯	◯	◯	◯

Q6: Interviewer: closed question, enumerate, only one answer possible.

In your opinion, should additional means/resources be put in place to ensure the cleanliness of the "Récollets" path?

Yes	No	*(Don't know)*
◯	◯	◯

Q7: Interviewer: open question, do not make any suggestions, simply note the answer.

Which ones?

_____

_____

_____

Q8: Interviewer: closed question, enumerate, only one answer possible.

In your opinion, are there insecurity problems on the "Récollets" path?

Strongly agree	Agree	Disagree	Strongly disagree	*(Don't know)*
◯	◯	◯	◯	◯

Q9: Interviewer: closed question, enumerate, only one answer possible.

In your opinion, should additional means/resources be put in place to ensure security on the "Récollets" path?

Yes	No	*(Don't know)*
◯	◯	◯

Q10: Interviewer: closed question, enumerate, only one answer possible.

In your opinion, which additional means/resources should be put in place to ensure security on the "Récollets" path?

Night lighting	◯
Closing the path at night	◯
Video surveillance	◯
Other:_____	◯
None	◯
(Don't know)	◯

EXPLANATION OF THE PROJECT

Landscaping project proposed by the City:

The landscaping project proposed by the city consists of the creation of a bicycle and pedestrian path, on the left bank of the river Vesdre on the waste water drainage pump between the "Grandes Rames" Street and the "Epargne" Street. The special feature of this landscaping project is the creation of a *natural plant cover* on the banks along the path, as shown in the picture. This image corresponds to the "Louise" Bridge.

The advantages resulting from the change are:

- the creation of a recreational and relaxation area
- an easier access to the river
- the possibility of taking a walk by the water and discovering the river in this manner
- the possibility of bicycling by the water
- the continuation of the "Récollets" path on the right bank
- the possibility of reaching the city centre faster

Q11: Interviewer: closed question, enumerate, only one answer possible.

Overall, would you be very favorable, rather favorable, rather unfavorable or very unfavorable to this landscaping project?

Very favorable	Rather favorable	Rather unfavorable	Very unfavorable	*(Don't know)*
◯	◯	◯	◯	◯

Q12: Interviewer: closed question, enumerate, only one answer possible.

If this landscaping project was carried out, would it encourage you to visit the site?

Yes	No	*(Don't know)*
◯	◯	◯

Q13: Interviewer: open question, do not make any suggestions, simply note the answer. Several answers are possible.

Which activity would you carry out there?

Walking/hiking	◯	Shortcut – between home and city centre	◯
Dog walking	◯	Sport activities (biking)	◯
Reading/ recreational time	◯	Fishing	◯
Playground (children)	◯	Other activities_____	◯
Shortcut – between home and workplace	◯	No other activity	◯
		(Don't know)	◯

Q : Second survey : Interviewer: closed question, enumerate, only one answer possible.

Do you live in the city of Verviers ?

Yes ◯ No ◯

Q14: Interviewer: closed question, enumerate, only one answer possible. – Question Evaluation Contingente 'CONTINGENT VALUATIONM'.

Would you agree to pay 25 Euros per year (± 2 Euros per month) in communal tax for the creation and maintenance of this project?

Yes ◯

In this table, up to which amount would you be willing to pay per year in communal tax for the creation and maintenance of this project? *Answer* _____

No ◯

In this table, which amount would you be willing to pay per year in communal tax for the creation and maintenance of this project? *Answer*_____

(Don't know/Refusal/0 euros) ◯ (Q9)

Q : Second survey :

If you were living in the city of Verviers, would you agree to pay 25 Euros per year (± 2 Euros per month) in communal tax for the creation and maintenance of this project?

Yes ◯

In this table, up to which amount would you be willing to pay per year in communal tax for the creation and maintenance of this project? *Answer* _____

No ◯

In this table, which amount would you be willing to pay per year in communal tax for the creation and maintenance of this project? *Answer*_____

(Don't know/Refusal/0 euros) ◯ (Q9)

Q15: Interviewer: open question, do not make any suggestions, simply note the answer. Several answers are possible.

For which reasons do you not wish to pay?

I shouldn't be the one paying ◯
The district should be the one paying ◯
It is not necessary to modifiy the state of this river ◯
My financial means won't allow me to pay ◯
I don't have enough information on which to base a decision ◯
I am afraid of paying for others ◯
It would prevent me from taking part in my activities ◯
I already pay to take part in a leisure activity ◯
I don't want the river to be modified ◯
I don't feel concerned ◯
Other reasons _____ ◯
(Don't know) ◯

Q16: Enquêteur : question fermée, exposer les deux scénarios, une seule réponse possible – Question « Choice Modelling ».

I am going to present you two landscaping possibilities, for which I would like to know your opinion.

Barren landscape:

The first possibility is the creation of a barren bicycle and pedestrian path. This is the same landscaping as presented previously. The difference is the gravel surface on the banks instead of the *natural plant cover*.

Overall, would you be very favorable, rather favorable, rather unfavorable or very unfavorable to this scenario?

Very favorable	Rather favorable	Rather unfavorable	Very unfavorable	*(Don't know)*
◯	◯	◯	◯	◯

Knowing that you are willing to pay €____ per year to the city council for the creation of the bicycle and pedestrian path with a natural plant cover, how much would you be willing to pay, per year, in Euros, to the city council for the creation and the maintenance of the barren path ? €_____

Knowing that you are unwilling to pay for the creation of the bicycle and pedestrian path with a natural plant cover, how much would you be willing to pay, per year, in Euros, to the city council for the creation and the maintenance of the barren path? €_____

Structured plant cover:

The second possibility is the creation of a bicycle and pedestrian path with more structured/controlled vegetation. It is the same landscaping as presented previously. The difference is the embellishment of the path through tubs of flowering plants along the banks of the river Vesdre.

Overall, would you be very favorable, rather favorable, rather unfavorable or very unfavorable to this scenario?

Very favorable	Rather favorable	Rather unfavorable	Very unfavorable	*(Don't know)*
◯	◯	◯	◯	◯

Knowing that you are willing to pay €____ per year to the city council for the creation of the bicycle and pedestrian path with a natural plant cover, how much would you be willing to pay, per year, in Euros, to the city council for the creation and the maintenance of the structured plant cover? €

_____

Knowing that you are unwilling to pay for the creation of the bicycle and pedestrian path with a natural plant cover, how much would you be willing to pay, per year, in Euros, to the city council for the creation and the maintenance of the structured plant cover? €_____

Q17: Interviewer: closed question, enumerate, only one answer possible.

Of the three scenarios, which do you prefer?

Natural plant cover (reference situation, presented previously) ◯

Barren landscape ◯

Structured plant cover ◯

Q18: Interviewer: open question, do not make any suggestions, simply note the answer. Several answers are possible.

Why did you choose this option?

_____

_____

_____

_____

Q19: Interviewer: closed question, enumerate, only one answer possible.

How useful were the visualizations to your understanding of the different options?

Very useful	Moderately useful	Slightly useful	Not useful at all	*(Don't know)*
◯	◯	◯	◯	◯

Q20: Interviewer: closed question, enumerate, only one answer possible.

If the bicycle and pedestrian path at the bank of the river Vesdre was created, would you go along the river Vesdre more often, as often or less often?

More often	Just as often	Less often	*(Don't know)*
◯	◯	◯	◯

Q21: Interviewer: open question, do not make any suggestions, simply note the answer.

In average, how many additional visits per month to the site (along the river Vesdre) would this correspond to?

1 additional visit per month	◯	More than 4 additional visits per month	◯
2 to 4 additional visits per month	◯	*(Don't know)*	◯

Q22: Interviewer: closed question, enumerate, only one answer possible.

Do you regularly visit certain Verviers parks?

Yes	No	(*Don't know)*
◯ (Q23)	◯	◯

Q23: Interviewer: open question, do not make any suggestions, simply note the answer.

If yes, which one(s)?_____

Parks

Tourelle park (Hospital) ◯
"Ancien Château des Moines" park (Stembert) ◯
Harmonie park ◯
Séroule park (Heusy) ◯
Fabiola park ◯
Ottomont park ◯
Récollets park (Récollets) ◯
Marie-Louise park (Limbourg street) ◯

Playgrounds

Ensival playground(Préry street) ◯
Deru playground ◯
Bielmont playground ◯
Rouheid playground ◯
Peltzer playground (Concorde street) ◯
Sottais playground ("1er de Ligne" street) ◯
Sauvage playground (Calamine street) ◯
Marie-Louise playground (Limbourg street/Marie-Henriette street) ◯
Pirouette ◯
Noël Fassotte playground ◯
Tourelles playground (Grand-Rechain road) ◯
Lentz playground (after the Louise bridge) ◯

Promenade

Récollets Promenade ◯
Rapsat embankment ◯

District

Petit-Rechain ◯
Andrimont ◯
Other_____ ◯
(Don't know) ◯

Q24: Interviewer: closed question, enumerate, only one answer possible.

How often do you visit this (these) park(s)?

Several times a year ◯
Several times a month ◯
Several times a week ◯
Every day ◯
(Don't know) ◯

Q25: Interviewer: closed question, enumerate, only one answer possible.

Do you regularly visit rivers and green areas in the region around Verviers?

Yes	No	(*Don't know*)
◯ (Q26)	◯	◯

Q26: Interviewer: open question, do not make any suggestions, simply note the answer.

If yes, which one(s)? _____

Rivers

- The Vesdre ◯
- The Meuse ◯
- The Ourthe ◯
- The Gileppe (affluent of the Vesdre) ◯
- The Helle (affluent of the Vesdre) ◯
- The Hoëgne (affluent of the Vesdre) ◯
- The Aisne (affluent of the Meuse) ◯
- The Amblève (affluent of the Meuse) ◯

Green spaces

- The Mariômont Woods ◯
- The Goé Woods ◯
- The Hèvremont Woods ◯
- The Jalhay Woods ◯
- The Princes Woods ◯
- The Moulin Woods ◯
- The Gattes Woods ◯
- The Nids d'Aguesses Woods ◯
- The Fraipont Woods ◯
- The Gileppe Lake ◯
- Other_____ ◯
- *(Don't know)* ◯

Q27: Interviewer: closed question, enumerate, only one answer possible.

How often do you visit this (these) area(s)? __

- Several times a year ◯
- Several times a month ◯
- Several times a week ◯
- Every day ◯
- *(Don't know)* ◯

Q28: Interviewer: open question, do not make any suggestions, simply note the answer.

Which is the main activity you take part in, in these green areas?

- Walking/hiking ◯
- Dog walking ◯
- Reading/recreational time ◯
- Playground (children) ◯
- Sport activities (biking) ◯
- Fishing ◯
- Other _____ ◯
- No other activity ◯
- *(Don't know)* ◯

QUESTIONS PERSONNELLES :

Q29: Interviewer: open question, do not make any suggestions, simply note the answer.

May I ask you your year of birth? – 19____

Q30: NOTE: Fill in without asking the respondent!

Gender

Male ☐

Female ☐

Q31: Interviewer: closed question, enumerate, only one answer possible.

Are you:

	Yes	No
Student	☐	☐
Worker	☐	☐
Social beneficiary	☐	☐
Retired	☐	☐

Q32: Interviewer: closed question, enumerate, only one answer possible.

What is your level of study?

Primary ☐

Lower secondary ☐

Higher secondary ☐

Higher education (university) ☐

Higher education (non-university) ☐

Q33: Interviewer: open question, do not make any suggestions, simply note the answer.

How many people live in your household, including yourself?

1 person ◯

2 people ◯

3 people ◯

4 people ◯

5 people ◯

6 people ◯

7 people ◯

8 people ◯

9 or more people ◯

Q34: Interviewer: open question, do not make any suggestions, simply note the answer.

How many children under 15 years old are there in your household?

None	◯	5 children	◯
1 child	◯	6 children	◯
2 children	◯	7 children	◯
3 children	◯	8 children	◯
4 children	◯	9 or more children	◯

Q35: Interviewer: open question, do not make any suggestions, simply note the answer.

How many cars does your household have? _____

Q36: Interviewer: closed question, enumerate, only one answer possible.

Are you the owner or tenant of your house/flat?

Home owner ☐

Tenant ☐

Q37: Interviewer: closed question, enumerate, only one answer possible.

We would like to analyze the results of this study according to the domestic revenue of the persons interviewed. I am going to give you a net revenue scale per month, could you let me know in which revenue bracket you are?

Below €500	◯	From € 2 000 to 3 000	◯
From €500 to 900	◯	From € 3 000 to 4 000	◯
From € 900 to 1 500	◯	Over € 4 000	◯
From €1 500 to 2 000	◯	*(No answer)*	◯

Q : Second survey : Interviewer : closed question, enumerate, only one answer possible.

Would you agree to tell me your municipality of residence?

_____

Would you agree to tell me your street name?

_____

Would you agree to tell me the number?

_____

5.4 Visual aids used during the face-to-face interview

Plate 1: Section for the planned project of the bicycle/pedestrian path (small-scale) (presented only to the respondents of the second survey conducted in the city centre of Verviers)

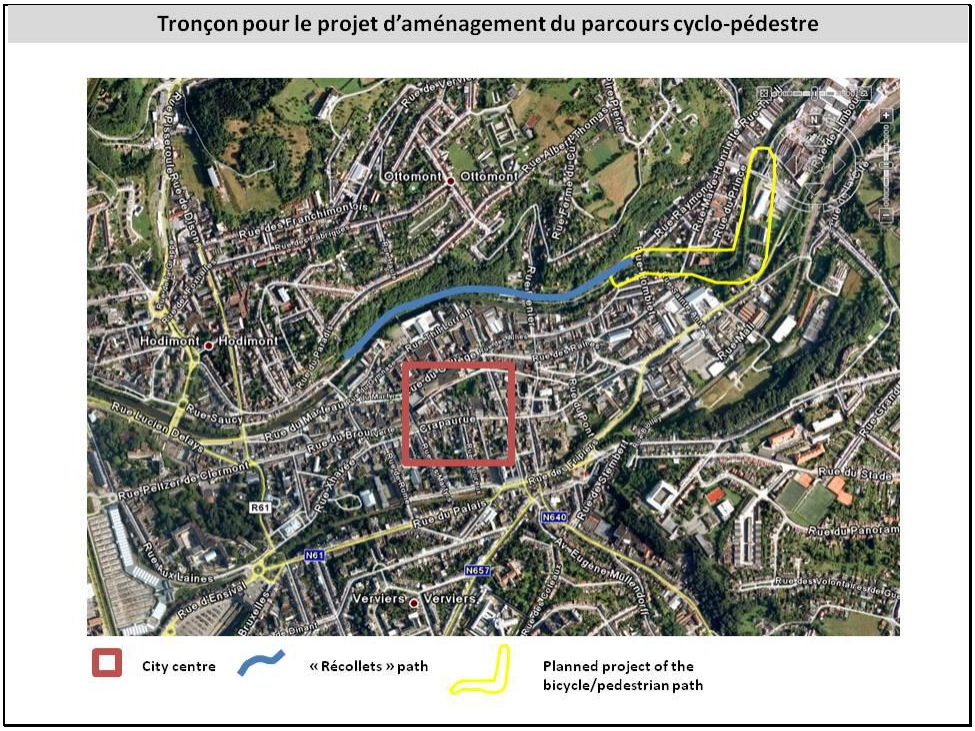


Plate 2: Section for the planned project of the bicycle/pedestrian path (large-scale)

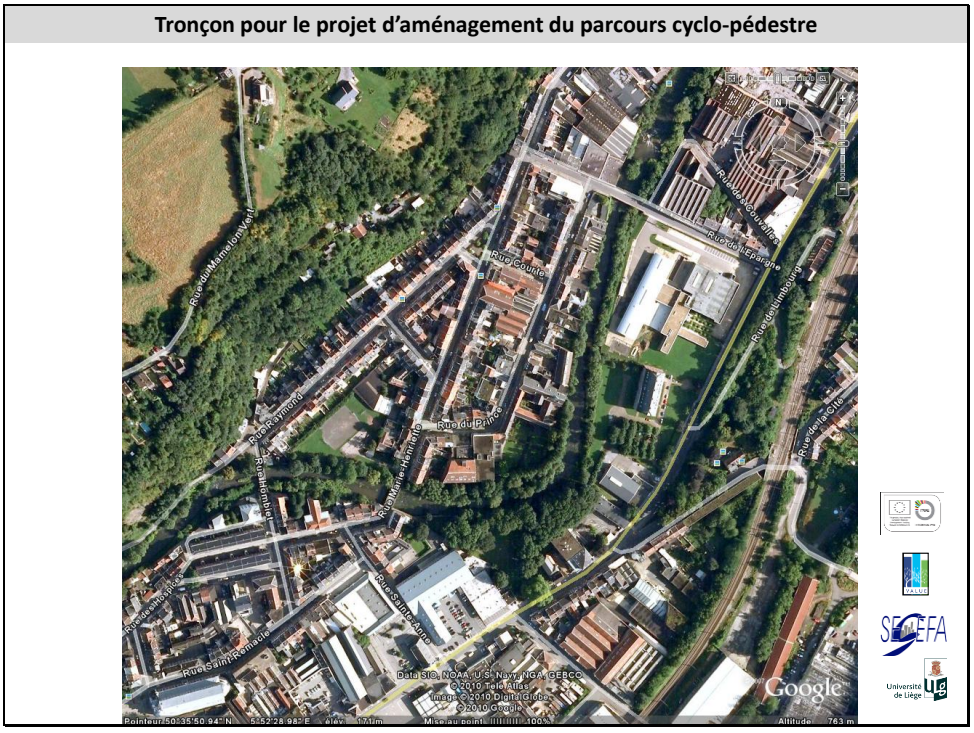


Plate 3: Bicycle and pedestrian path + natural plant cover

Chemin cyclo-pédestre + couvert végétal naturel

Plate 4: Present-day situation / Photo of the « Louise » bridge taken from the Marie-Henriette park.

Situation actuelle

Photo du pont Louise prise du parc Marie-Henriette.

Plate 5: Elicitation format (per year and per month) for elicitation of willingness to pay for people accepting to pay €25 of local tax per year for maintaining the cycle/pedestrian path - CONTINGENT VALUATION

Par an (EUR)	Par mois (EUR)
200	16.66
150	12.50
100	8.33
80	6.67
70	5.83
60	5
50	4.16
40	3.33
35	2.92
30	2.50
25	2.08

Plate 6: Elicitation format (per year and per month) for elicitation of willingness to pay for people refusing to pay €25 of local tax per year for maintaining the cycle/pedestrian path - CONTINGENT VALUATION

Par an (EUR)	Par mois (EUR)
20	1.66
15	1.25
10	0.83
5	0.42
0	0

Plate 7: Bicycle and pedestrian path + barren surface

Chemin cyclo-pédestre + revêtement en gravier

Plate 8: Bicycle and pedestrian path + structured plant cover

Chemin cyclo-pédestre + aménagements floraux

Plate 9: Elicitation format (per year and per month) for elicitation of willingness to pay for the two alternative scenarios - CHOICE MODELLING

Par an (EUR)	Par mois (EUR)
200	16.66
150	12.50
100	8.33
80	6.67
70	5.83
60	5
50	4.16
40	3.33
35	2.92
30	2.50
25	2.08
20	1.66
15	1.25
10	0.83
5	0.42
0	0

6 BIBLIOGRAPHY

ALLIN S., HENNEBERRY J. (2010). Final Report, Action 1.2, Baseline Analysis of Existing Economic Valuation Tools for Application to Green Infrastructure Investments, January 2010, *Valuing Attractive Landscapes in the Urban Economy*, Department of Town and Regional Planning, University of Sheffield, Western Bank, Sheffield, S10 2TN, UK.

ARROW K., SOLOW R. *et al.* (1993). Report of the NOAA Panel on Contingent Valuation, s.l., s.n.

ASAKAWA S., YOSHIDA K., YABE K. (2004). Perceptions of urban stream corridors within the greenway system of Sapporo, Japan, *Landscape and Urban Planning*, 68, pp. 167-182.

BATEMAN I. J., CARSON R. T., DAY B. (2002). Economic Valuation with Stated Preference Techniques: A Manual. Camberley Edward Elgar.

BATEMAN I. J., TURNER R. K. (undated): Evaluation of the Environment: the Contingent Valuation Method. CSERGE Working Paper GEC 92-18.

BAS A., GASTINEAU P., HAY J. (2010). Tâche 2 : Valorisation monétaire des atteintes. Annexe 11 - Fiches méthodes de quantification du dommage écologique. *Valorisation économique des dommages écologiques causés à l'environnement marin (VALDECO)- Application au cas des marées noires*. Extracted from http://www.cedre.fr/project/valdeco on 28/07/2011.

BEAUWENS C. (1994). *Le patrimoine industriel de la région verviétoise*. Collection Portraits et Profils, n°4, Ministère de la Région wallonne, Namur, Fondation Ad. Hardy, Dison.

BOGNER F. X., WISEMAN M. (1997). Environmental perception of rural and urban pupils. *Journal of environmental psychology*, vol. 17, pp.111-122.

CARSON R. T., HANEMANN W. M., KOPP R. J., KROSNICK J. A., MITCHELL R. C., PRESSER S., RUUD P. A. and SMITH V. K. with CONAWAY M. and MARTIN K. (1996). *Was the NOAA Panel correct about Contingent Valuation?* Discussion Paper 96-20, Resources for the Future, Washington.

COMMUNE DE BRAIVES (2009). Walks. Extracted from http://www.braives.be/page104575042.aspx on 05/09/2011.

COULONT S., NICOLAI H. (2002). Itinéraire de l'eau et de la laine au Pays de Vesdre. *Hommes et Paysages, 33, Société royale belge de Géographie et Maison du Tourisme du Pays de Vesdre.*

CREATIVE RESEARCH SYSTEMS (2010). Sample size calculator. Extracted from http://www.surveysystem.com/sscalc.htm on 05/07/2011.

DEPARTMENT OF HEALTH (1999). Confidence Intervals – Statistics Teaching Tools. Extracted from http://www.health.state.ny.us/diseases/chronic/confint.htm on 12/07/2011.

HAGERHALL C.M. (2001). Consensus in landscape preference judgements. *Journal of environmental psychology*, vol. 21, pp.83-92.

HIDANO N., TAKESHITA S., (2006). The effects of warm glow on scope sensitivity and income elasticity in contingent valuation survey. Paper presented at the Third World Congress of Environmental and Resource Economists. Kyoto: AERE; EAERE; SEEPS, July, 28 p.

INTERREG IVB – NWE - Application Form, First Call, 2007, no published.

KALTENBORN B. P., BJERKE T. (2002). Associations between Landscape Preferences and Place Attachment: a study in Røros, Southern Norway, *Landscape Research*, vol. 27(4), pp.381-396.

KESKIN B., HENNEBERRY J., MELL I. (2011). Work Package 4, Action 4.2. *Estimating the Impact of Individual Green Investments on the Sheffield and Manchester Economies: Input-Output and Local Multiplier Analyses,* Department of Town and Regional Planning, University of Sheffield, Western Bank, Sheffield, S10 2TN, UK.

LE LAY Y.-F., PIEGAY H., COSSIN M. (2005). Les enquêtes de perception paysagère à l'aide de photographies, *actes des septièmes rencontres de Théo Quant*.

LUYTEN S., VAN HECKE E. (2009). «Les régions urbaines belges en 2001», Noyaux d'habitat et régions urbaines dans une Belgique urbanisée (VAN HECKE E., HALLEUX J.-M., DECROLY J.-M. et MERENNE-SCHOUMAKER B.), *Monographie n°9 de l'Enquête Socio-économique 2001*, SPF Economie, PME, Classes moyennes et Energie, Bruxelles., pp. 74-151.

MAREK A., VIAUD-MOUCLIER C., HALLEUX J.-M., DEVILLET G. (2010). Theoretical discussion on economic valuation of greenness: from ecosystem services to green infrastructures - Considerations based on national and European projects. Ecological and social innovation. *Proceedings of the International Conference of the European Network of Territorial Intelligence*, Strasbourg (France), 17-19 November 2010.

MOGAS J., RIERA P., BENNETT J. (2006). A Comparison of contingent valuation and choice modelling with second-order interactions. *Journal of Forest Economics* 12, p. 5-30.

MOREAU J., VIAUD-MOUCLIER C., MAREK A. (2010). Internal Report, Action 4.1, Report on Focus Group Interviews in Verviers – Cycling and walking path along the river Vesdre, August 2010, *Valuing Attractive Landscapes in the Urban Economy*, SPI and SEGEFA-ULg, Belgium.

NET-iris (2012) : Les indicateurs de l'immobilier. Extracted from http://www.net-iris.fr/indices-taux/immobilier/31-index-bt01-indice-national-batiment-bt-01 on 28.02.2012.

OFFICE DU TOURISME (2011). Parcours « Laine et Eau » à travers la ville de Verviers, Extracted from http://www.verviers.be/tourisme/Chap_06_In.htm on 15.03.2011.

PAPPALARDO M. (2010). Donner une valeur à l'environnement : la monétarisation, un exercice délicat mais nécessaire. La Revue du CGDD, Commissariat général au développement durable, France

PEARCE D., ÖZDEMIROGLU E. (2002). Economic valuation with Stated Preference Techniques. Summary Guide. London: 94.

PHILIPSON L. (2011). A contribution to understand the different levels of spatial planning in 5 countries of North West Europe: Belgium, England, France, Germany and the Netherlands. Valuing Attractive Landscapes in the Urban Economy (VALUE), Wageningen UR.

RAOSOFT (2004). Sample size calculator. Extracted from http://www.raosoft.com/samplesize.html on 05/07/2011.

RYAN, R. L. (1998). Local perceptions and values for a Midwestern river corridor, *Landscape and Urban Planning, vol.* 42, pp. 225–237.

RUELLE C. (2008). La qualité paysagère et l'ancrage identitaire des espaces d'activités urbains : un atout pour le développement de l'économie urbaine. *Territoire(s) wallon(s). Séminaire de l'Académie Wallonie-Europe.*

SACKS J. (2002). The Money Trail. Measuring your impact on the local economy using LM3. *The Countryside Agency, New Economics Foundation,* 118 p.

SHEFFIELD CITY COUNCIL – SOUTH YORKSHIRE FOREST PARTNERSHIP (2007). Interreg IVB North West Europe Application Form 1st Call – Valuing Attractive Landscapes in the Urban Economy (VALUE), European Regional Development Fund – European Territorial Cooperation 2007-2013.

SCOTT M.J., CANTER D.V. (1997). Picture or place? A multiple sorting study of landscape, *Journal of environmental psychology*, Vol. 17, pp. 263-281.

TERRA S. (2005): Guide de bonnes pratiques pour la mise en œuvre de la méthode d'évaluation contingente, *Direction des études économiques et de l'évaluation environnementale*, Série Méthode (http://www.ecologie.gouv.fr), 05-M04, 77 p.

TODOROVA A., ASAKAWA S., AIKOH T. (2004). Preferences for and attitudes towards street flowers and trees in Sapporo, Japan [J].*Landscape and Urban Plan*, 69:403-416.

TOWN AND COUNTRY PLANNING ASSOCIATION (2008). The essential Role of Green Infrastructure: Eco-towns Green Infrastructure Worksheet: Advice to Promoters & Planners. Department for Communities and Local Government (DCGL), Natural England.

VERMEIRE B., VERSPECHT A., GELLYNCK X., GHYSELINCK N., GELLINCK L., STUBBE F. (2009). "Development of an economic valuation model for green infrastructure on the basis of a literature review", Ghent/Bruges/Belgium.

VESPECHT A., VANDERMEULEN V., VERMEIRE B., GELLYNCK X., VANHUYLENBROECK G. (2010). "Development and application of an instrument to measure the economic impact of green investments in the urban fringe around Bruges within the framework of the land use plan 'Field Zone Bruges - Ex-ante evaluation", Ghent.

WEBER P., PRELAZ-DROUX R., RÜEGG J., TILLEMANS L. (2011). Land management approaches to supply enough land at the right place and time: the answers given by the canton of Vaud, Switzerland. *COST TU0602 - Land management for urban dynamics - Working Group 2.* COST European Cooperation in Science and Technology. Transport and Urban Development (TUD) Action TU0602.

WHITTINGTON D., CASSIDY G., AMARAL D., McCLELAND E., WANG H., POULOS C. (1994). The economic value of improving the environmental quality of Galveston Bay.

WORLD BANK INSTITUTE (2002). Environmental Economics and Development Policy Course CONTINGENT VALUATION SESSION 28, July 15-26**,** Washington**,** D.C.

SEGEFA
UNIVERSITÉ DE LIÈGE

Faculté des Sciences
Département de Géographie

Allée du 6 Août, 2
B-11 - Sart Tilman
4000 Liège

www.segefa.be
tél : +32 4 366 53 19
fax : +32 4 366 56 30
e-mail : G.Devillet@ulg.ac.be
secrétariat : +32 4 366 57 47