Poverty and Social Analysis Report

Project number: 52230-001
April 2020

PRC: Xiangtan Low-Carbon Transformation Sector Development Program

Content

I. Introduction 1
A. Project background 1
B. Project scope 1
C. Project content 1
II. Methodology 3
III. Socioeconomic Status 5
A. Socio-economic Profile of Xiangtan Municipality 5
1. Administrative division 5
2. Population 5
3. Economy 6
4. Employment 6
5. Education 6
B. Socioeconomic situation in the project area 7
IV. Social Impact Analysis 11
A. Beneficiaries of the project 11
B. Positive impacts 11
C. Negative effects 13
D. Residents' views about project-related issues 13
1. About the Project 13
2. About transportation 14
3. About green building 25
4. About urban resilience/flooding 27
5. About energy use 27
6. About community infrastructure 31
7. About participation 31
E. Residents’ demands for the Project 33
1. Residents' attitude 33
2. Residents' expectation 33
3. Residents' ability and willingness to pay 36
V. Poverty analysis 40
A. Poverty status in the project area 40
1. Poverty situation 40
2. Poverty reduction in Xiangtan Municipality 41
B. The role of the Project in poverty reduction 41
1. Positive impacts of the Project on poverty reduction 41
2. Negative impact on poor households 42
C. Views of different income groups on the project-related issues 42

1. About the Project 42
2. About the transportation 43
3. About green building 48
4. About climate resilience/flooding 50
5. About energy use 50
6. About community sub-project 51
7. About participation 53
D. Demands for the Project 54
1. Attitude to other sub-projects 54
2. Poor household's ability and willingness to pay 54
VI. Gender analysis 56
A. Situation of local women 56
1. Women in Xiangtan Municipality 56
2. Women in the project area 56
B. Project Impacts on Women 58
1. Positive impacts on women 58
2. Negative impacts on women 59
C. Women' views about project-related issues 59
1. About the Project 59
2. About transportation 59
3. About green building 66
4. About urban resilience/flooding 67
5. About energy use 68
6. About community sub-project 70
7. About participation 71
D. Women' demands for the Project 72
1. Women' attitude 72
2. Women' ability and willingness to pay 73
VII. Ethnic Minority (EM) 75
VIII. Social and Gender Actions 75

I. INTRODUCTION

A. Project background

1. Xiangtan, an old industrial town undergoing rapid urbanization and industrial transformation, is located 40 kilometers south of Hunan's capital, Changsha. Located within the Changsha-Zhuzhou-Xiangtan cluster city, Xiangtan has been a key economic driver of Hunan province. Its growth also led to a substantial increase in greenhouse gas (GHG) emissions: from 26,270 kilotons of carbon dioxide equivalent (kt CO2e) in 2005 to 50,560 kt CO2e in 2015. Emissions from energy and industrial activities doubled and those from transport activities increased five times. Even with its effort to reduce GHG intensity per unit of gross domestic product (GDP) by 60% during that period, Xiangtan's GHG intensity is still much higher than that in Hunan province or the PRC.

2. Xiangtan possesses strategic importance nationally and regionally. Xiangtan is a part of nation-wide initiative as an integrated transport hub, a 'two-oriented society comprehensive reform' area, and a low-carbon city. Xiangtan is the first smart pilot and green GDP city selected by the Hunan provincial government. Though the municipal government has begun initial works, more significant and orchestrated actions are needed to achieve the target.

B. Project scope

3. The Project comprises (i) a policy-based loan supporting reforms that will update existing policies and introduce innovative measures to unlock potentials for carbon reduction; and (ii) a project loan that demonstrate how low-carbon and resilient infrastructure transformation, coupled with information and knowledge systems using information and communications technology (ICT) could foster continuous LCT.

4. The expected impact of the Project will be carbon emissions peak achieved in Xiangtan by 2028. The expected outcome will be the use of low-carbon enabling systems in Xiangtan increased. The Program will have four outputs of which outputs 1, 2, and 4 will be under the project loan while output 3 will be supported by the policy-based loan.

C. Project content

5. For four outputs, various sub-projects are proposed as following:

6. Output 1: Low-Carbon and Resilient Infrastructure Transformation Demonstrated. Physical infrastructure transformation with integrated design of cross-sectoral interventions will be demonstrated. Road infrastructure will be transformed to ensure seamless access to public mobility systems that are safe and inclusive to all, including children, elderly people, and persons with disability. Incorporating safety would support the shift to low-carbon modes of transport. Mobility system transformation includes: (i) installation of comprehensive bus priority lanes (63 kilometers), integrated with improved bicycle network and pedestrian facilities; (ii) school zone transformation for children's road safety at five primary schools; and (iii) street transformation for climate resilient and multi-purposed street for people. Deployment of 100 electric buses and the installation of 790 e-charging units at 31 locations will also lessen GHG emissions and contribute to air quality improvement. The construction of the first 'EDGE-certified' hospital building in the PRC will demonstrate the integration of passive building design, clean energy technologies, and ecosystem-based adaptation (EbA) measures. Other infrastructure transformation includes: (i) retrofit of a run-down public building to be equipped with high energy and water saving features and appliances; and (ii) improvement of public facilities and other urban infrastructure at 20

urban communities showing practical ways to build a low-carbon, resilient, and livable Xiangtan.

7. Output 2: Information and Knowledge Platforms Established for Informed Decision Making and Behavior Changes. Physical transformation complemented by ICT and knowledge platforms will complete and sustain LCT. Under this output, a number of sectoral ICT platforms will be installed or upgraded, and then, consolidated into a city-wide ICT platform. These are the: (i) intelligent transport system (ITS) that will be reprogrammed to prioritize people and public mobility systems; (ii) building energy management system to monitor and improve energy efficiency of 200 public buildings; (iii) community-scale energy and utility management system to optimize operational efficiency of over 1,300 companies; (iv) early flood warning system to monitor and analyze potential risks caused by fluvial and pluvial floods; and (v) environmental monitoring and assessment system. These platforms will enable better decision making and foster behavior changes towards LCT.

8. Output 3: Low-carbon transformation policy reforms adopted. The above mentioned infrastructures and system transformations will be sustained and scaled up by policy, institutional, and operational reforms, and outreach activities. Reform areas include: (i) introduction of parking policy and institution setup; (ii) market and demand-driven operation of public buses; (iii) people-oriented ITS operation; (iv) school-zone reform for road safety; (v) clean district energy system and waste heat recovery; (vi) industrial energy and utility management and operation; (vi) low-carbon building sector reforms through green building certification, energy performance contract, and green financing, building energy management system, and energy statistics; (vii) capacity building on EbA and climate adaptation planning tool; and (viii) data security and standardization. Reform measures will be carried out in two equal tranches of $25 million each. Pursuing the XMG's clear and long-term commitment to carbon peaking target, the LCT policy reforms will create norms of a low-carbon, resilient, and livable city by regulating, incentivizing, guiding, and supporting all relevant actors of the society.

9. Output 4: Capacity Building and Program Management Enhanced. To ensure successful Program implementation, a consulting firm will be engaged to assist XMG's project management office comprising of multi-agency representatives. The consultant will also provide trainings and workshops in operating the systems as well as identifying comprehensive plans and programs for sustaining low-carbon transformation.

II. METHODOLOGY

10. This poverty and social analysis is in aligned with ADB's pertinent documents, e.g. Safeguard Statement Policy (2009), Handbook on Poverty and Social Analysis (2012) and Gender and Development Policy.

11. The objectives of social survey include: (i) obtain the primary socioeconomic information of households in the project area; (ii) understand local residents' lifestyle about travel mode, energy consumption and etc.; (iii) get to know local residents' understanding and attitude towards low-carbon lifestyle, so as well their potential participation; (iv) consult with local residents for opinions on the potential project components including central heating/cooling, public transportation improvement, green building, pertinent campaign and education; so as well their suggestions in order to improve project design from social aspect; (v) assess potential positive and negative impacts of the Project on local residents; (vi) collect the information on local residents' willingness to pay and ability to afford the tariff or increase, e.g. parking charging and bus fares; (vii) publicize the Project, and find the way of promoting public participation during the project implementation; (viii) especially, assess the concerns and demands of vulnerable groups, e.g. the elderly, the poor, the disabled, and the women.

12. For this poverty and social analysis, the used methodology include literature review, socioeconomic questionnaire survey, FGDs, and key informant interview.

13. **Literature Review.** The following documents and materials were reviewed: (i) Background information or material associated with the project, such as the proposals of all projects and project feasibility study reports; (ii) Official statistical information, such as statistical yearbooks, statistical bulletin, the "Thirteenth-Five" year economic and social planning, relevant policy documents of all levels governments; (iii)data and information provided by the related departments such as poor population, ethnic minorities, the situation of women, poverty alleviation planning, development planning and assessment report of women, yearly work summaries, research reports, Internet news and so on. It helps to understand the current local social, economic, environment and institutional status and also the future plan.

14. **Socioeconomic Questionnaire Survey.** A questionnaire survey was conducted during the August of 2019. Random sampling method was adopted. Local residents of almost all communities in Xiangtan City were selected. Totally 406 respondents were involved, of which, 196 interviewees were men (48.3%), 210 were women (51.7%), 25 were the elderly over 60 years old (6.2%), 7 (1.7%) were the disables, and 37 were students (9.3%). Another questionnaire survey was conducted online in February 2020 because of various limitations during the novel corona-virus epidemic in China. The new survey targeted at the residents of 20 communities involved in a new project sub-component proposed by Xiangtan PMO in January 2020. Totally there are 562 effective respondents, of which, 347 were women (61.7%), 61 were the elderly over 60 years old (10.9%), and 78 were the poor who are enjoying the urban minimum living subsistence allowance (13.9%). Further, a different questionnaire were distributed to the community managers for their opinions and suggestions. Also, some community managers were called for more clarification.

15. **Focus Group Discussion.** Total of 21 Focus group Discussions/Workshops were conducted which included 1 student group, 2 handicapped groups, 4 urban poor groups, 6 women groups, and 8 mixed ordinary residents groups. During the FGDs, the survey team introduced the Project and promoted public participation; understood local residents' attitude, views, comments, expectations and requirements on the Project; specially paid attention to the vulnerable groups' special demand.

16. **Key Person Interview.** Key persons from communities, Women Federation, Disables Federation, and municipal Civil Affairs Bureau, were interviewed to better understand the project design, local situation of, e.g. poverty, women, and the disables, and pertinent local policies and implementation. Also, their attitude, views, comments, expectations and demands on the Project were understood. In addition, their suggestions on how to enhance the positive project impacts and minimize the negative impacts were heard.

Fig 2-1: Women' group

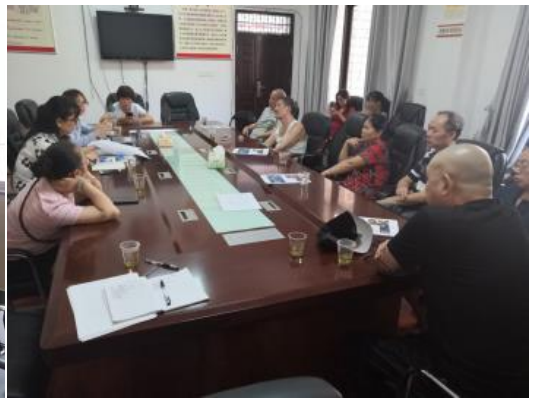

Fig 2-2: Urban poor group

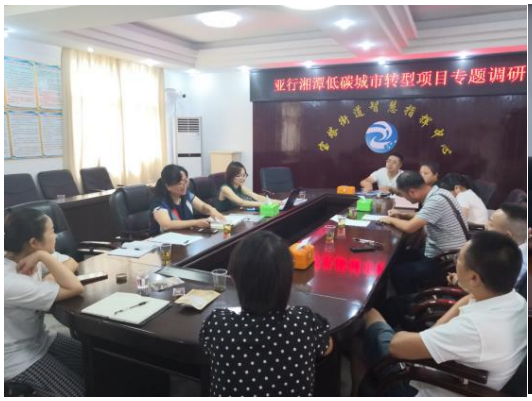

Fig 2-3: Ordinary residents' group

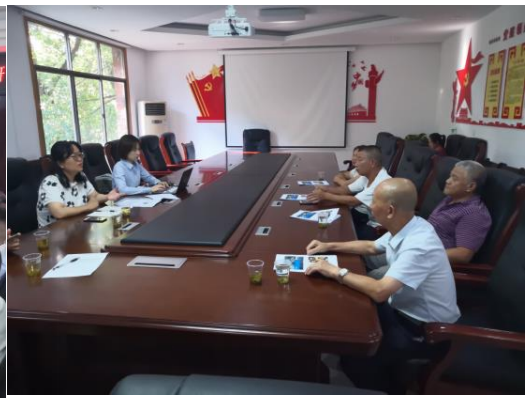

Fig 2-4: The disabled group

Fig 2-5: Residents introducing their experience of low-carbon lifestyle

III. SOCIOECONOMIC STATUS

A. Socio-economic Profile of Xiangtan Municipality

1. Administrative division

17. **Xiangtan Municipality** is located in the eastern part of Hunan Province, the lower reaches of Xiang River. It is a member of middle reaches of the Yangtze River and the central Municipality of the National Changsha-Zhuzhou-Xiangtan 'Two-oriented society' comprehensive supporting reform pilot zone. It has five administrative county (city) districts (Yuhu, Yuetang, Xiangtan, Xiangxiang and Shaoshan) and four demonstration zones (Xiangtan High-tech zone, Xiangtan Economic Development Zone, Zhaoshan demonstration Zone and Tianyi demonstration Zone). The Project will be implemented in the main city, including two administrative districts, i.e. Yuhu and Yuetang.

Table 3-1: Administrative Divisions of the Project Area

Region	Area ($Km^{2)}$	Town\ Township	Street Office	Village	Community
Xiangtan Municipality	5,006	4	17	85	120
Yuhu District	451	4	8	69	72
Yuetang District	206	0	9	16	48

Source: Xiangtan Municipality Government Website

2. Population

18. At the end of 2018, there is 2.865 million of permanent residents in Xiangtan Municipality. The urbanization rate is 62.9%. Details of districts see Table 3-2.

Table 3-2: Population of the Project area (2018)

Region	permanent residents (1,000 persons)	Gender			Rural (1,000 persons)
		Male (1,000 persons)	Female (1,000 persons)	Female proportion (%)	
Xiangtan Municipality	2,865	1,468	1,397	48.8	1,063
Yuhu District	602.3	307.7	294.6	48.9	N/A
Yuetang District	475.2	242.7	232.5	48.9	21

Source: Xiangtan Municipality, Yuhu District and Yuetang District's Statistical Bulletin on National Economic and Social Development (2018); internet information.

19. The sex ratio and natural growth rate in each district are listed below.

Table 3-3: Birth, Death, and Natural Growth Rate of Population (2018)

Region	Birth		Death		Natural growth	
	Population (1,000 persons)	Birth Rate (‰)	Population (1,000 persons)	Death Rate (‰)	Population (1,000 persons)	Growth Rate(‰)
Xiangtan Municipality	32	11	19	6.8	N/A	4.3
Yuhu District	5	N/A	3	N/A	N/A	2.44
Yuetang District	4	10.7	3	7.6	1	3.04

Source: Xiangtan Municipality, Yuhu District and Yuetang District's Statistical Bulletin on National Economic and Social Development (2018).

3. Economy

20. In 2018, the GDP of Xiangtan Municipality is 216.14 billion yuan. The ratio of primary, secondary, tertiary industry is 5.8:48.2:46.0. Per capita GDP is 75,609 yuan. Urban residents' per capita disposable income is 36,866 yuan while rural residents' per capita disposable income is 19,408 yuan. The details of the three-industry ratio and fiscal revenue and expenditure of each district are listed as below.

Table 3-4: Economic status of the Project area (2018)

Item	Ratio of primary, secondary, tertiary industries	Revenue	Financial expenditure
Units	%	billion Yuan	billion Yuan
Xiangtan Municipality	5.8:48.2:46.0	21.48	30.15
Yuhu District	2.2:42.8:55.0	2.06	1.7
Yuetang District	0.9:53.7:45.4	8.59	3.49

Source: Xiangtan Municipality, Yuhu District and Yuetang District's Statistical Bulletin on National Economic and Social Development (2018).

4. Employment

21. In 2018, there are 64,000 new urban labor force in Xiangtan Municipality. The unemployment rate of Yuetang District is low. Details see the table below.

Table 3-5: Employment status of the Project area (2018)

Item	New urban workers	New rural labor transfer employment	Unemployment rate
Units	1,000 persons	1,000 persons	%
Xiangtan Municipality	64	N/A	N/A
Yuhu District	19	0.3	N/A
Yuetang District	19	N/A	3.0

Source: Xiangtan Municipality, Yuhu District and Yuetang District's Statistical Bulletin on National Economic and Social Development (2018).

5. Education

22. In 2017, there are 10 colleges/universities in Xiangtan Municipality, with 133,000 students. There are 10,000 students in ordinary secondary vocational schools and 116,000 students in

ordinary middle schools. There are 149,000 students in ordinary primary schools. See the table below for details.

Table 3-6: School and student status (2017)

Item	Regular Institutions of Higher Education	Secondary Vocational School	Middle School	Primary School
Xiangtan schools	10	7	165	376
Xiangtan students (thousand persons)	133	1	116	149

Source: Xiangtan Statistical Yearbook (2018)

B. Socioeconomic situation in the project area

23. Through survey socioeconomic and demographic information are collected.

(1) Population situation

24. A total of 406 households (1,165 persons) were surveyed, of which, 579 are female accounting for 49.7% of the total population. The average family size is 2.87. See the table below for details.

Table 3-7: Gender

Gender		
Option	Frequency	Percent(%)
man	586	50.3
women	579	49.7
Total	1,165	100.0

(2) Relationship with household head

25. Of the 406 households (1,165 persons) were surveyed, 355 (30.5%) had a child relationship with the head of the household, and 350 (30%) were heads of household. See the table below for details.

Table 3-8: Relationship with household head

Relationship with household head		
Option	Frequency	Percent(%)
Household head	350	30.0
Spouse	302	25.9
Children	355	30.5
Parents	65	5.6
Siblings	4	.3
Others	89	7.6
Total	1,165	100.0

(3) Living status

26. Of the 406 households (1165 persons) surveyed, 4 persons did not answer. Among the 1161 persons who answered, the vast majority were the permanent residents of Xiangtan City, accounting for 93.9% of the total. The specific living conditions are shown in the table below.

Table 3-9: Living status

Living status		
Option	Frequency	Percent(%)
Permanent	1,090	93.9
Temporary	34	2.9
not in Xiangtan	37	3.2
Total	1,161	100.0

(4) Age

27. The age group of 406 households (1,165 persons) is shown in the table below.

Table 3-10: Age

Age		
Option(year)	Frequency	Percent(%)
Below 10	142	12.3
10-20	118	10.2
20-30	195	16.8
30-40	232	20.0
40-50	239	20.6
50-60	142	12.3
60-70	59	5.1
Over 70	31	2.7
Total	1,158	100.0

(5) Disability or not

28. Among the 1,165 people surveyed, the majority were non-disabled. See the table below for details.

Table 3-11: Disability or not

Disability or not		
Option	Frequency	Percent(%)
Yes	18	1.6
No	1,138	98.4
Total	1,156	100.0

(6) Nationality

29. Of 1,165 people in 406 households, 9 people did not answer. Among the remaining 1,156

people, Han people account for the vast majority. Ethnic minority people is very few, while Tujia people is more than other EM groups.

Table 3-12: Nationality

Ethnic Origin		
Option	Frequency	Percent(%)
Han	1,145	99.0
Tujia	8	.7
Miao	2	.2
Other	1	.1
Total	1,156	100.0

(7) Education

30. Among the 406 households with 1,165 people surveyed, 212 people were excluded from the age of 16 years old and below . Among the remained 953 people, the number of people with high school education is the highest (26.9%), and the number of people with graduate degrees and above is the least (3.5%). The specific education level is shown in the table below.

Table 3-13: Education

Education		
Option	Frequency	Percent(%)
No schooling	4	.4
Primary school	46	4.8
Secondary School	188	19.7
High school	256	26.9
College	208	21.8
University	218	22.9
Postgraduate or above	33	3.5
Total	953	100.0

(8) Occupation

31. Of the 406 households (1,165 persons) surveyed, 1,064 answered their present occupation status. Among them, there are more self-employed persons (25.3%), followed by private enterprise employees (20.0%), school students (16.8%), retirees (10.6%) and government/public institution employees (10.5%). See the table below for details.

Table 3-14: Occupation

Occupation		
Option	Frequency	Percent(%)
Government/public institution employee	112	10.5
State-owned enterprise	57	5.4
Private enterprise	213	20.0
Self-employed	269	25.3
Farmer	32	3.0
Soldier	1	.1
Housewives	43	4.0
Unemployed	23	2.2
In-school student	179	16.8
Retired	113	10.6
Other, specify	22	2.1
Total	1,064	100.0

(9) Monthly income

32. Among the 406 households with 1,165 persons surveyed, 300 were excluded from housewives, students and some retirees. Among the remained 865 people, 339 (39.2%) earned between 3,001 and 6,000 yuan, followed by 1,501 to 3,000 yuan (26.8%) and less than 1,500 yuan (15.3%), with fewer high-income people.

Table3-15: Monthly income

Monthly income (Yuan)		
Option(yuan)	Frequency	Percent(%)
1,500 or less	132	15.3
1,501~3,000	232	26.8
3,001~6,000	339	39.2
6,001~10,000	114	13.2
10,001~15,000	31	3.6
15,001~20,000	11	1.3
20,000 or more	6	.7
Total	865	100.0

IV. SOCIAL IMPACT ANALYSIS

A. Beneficiaries of the project

33. Broadly speaking, the whole Xiangtan City will benefit from the implementation of the present Project. The total population of 1.08 million living in two administrative districts (Yuetang and Yuhu), 17 streets, and 120 communities will be benefited. Even, it will benefit a large number of external visitors or tourists.

34. Detailed beneficiaries of sub-projects are listed in the table below:

Table 4-1: Project beneficial area and beneficiaries

Project	Benifited entities	Beneficiaries (persons)
Output 1: Low-Carbon and Resilient Infrastructure Transformation Demonstrated		
(i)installation of comprehensive bus priority lanes and etc.	113 communities of 58 Streets	About 0.5 million local people
(ii) school zone transformation for children's road safety at five primary schools	5 schools	713 teachers, 11,256 students, and their parents
(iii) street transformation for climate resilient and multi-purposed street for people	6 communities of 2 Streets	65,516 local people
(iv)the first "EDGE-certified" hospital building	whole city	Over 190 thousand patient · times per year
(v)improvement of public facilities and other urban infrastructure at 20 urban communities	20 communities	Over 180 thousand local people
Output 2: Information and Knowledge Platforms Established for Informed Decision Making and Behavior Changes	the whole city	1.08 million local people
Output 3: Low-carbon transformation policy reforms adopted		
Output 4: Capacity Building and Program Management Enhanced		
TOTAL	the whole city	1.08 million local people

Source: From various departments

B. Positive impacts

(1) Providing local residents with better bus services

35. The implementation of the Project will provide local residents with better bus services. The bus priority system, including setting the bus priority lanes of main trunk roads, optimizing bus routes and reprogramming the traffic lights, will effectively increase the bus speed and reduce the waiting time.

36. The upgrading of bus stops will enhance the passenger's satisfaction. The real-time display will help the passengers to visually see the upcoming buses and the time they need to wait. It especially works for the elderly who are not familiar with mobile bus Apps. The

improvement of the bus App will improve the accuracy of bus information and thus encourage more people to use for more convenient bus travel.

37. The provision of 100 new e-buses will help to alleviate the bus shortage at the peak hours and change the crowded status.

38. Better bus services will increase passengers' satisfaction, encourage more people to take bus and reduce using their cars, which will effectively contribute to reduce the carbon emission.

(2) Providing local residents with safer travel and more inclusive access

39. The implementation of the Project will provide local residents with safer travel and inclusive access. The upgrading of cycling ways will specially protect the cyclists with highly visible signs and enough space. The upgrading of pedestrian walkways will make pedestrians much safer and more convenient than before. Especially it will help the elderly and the disables to get equal access to the walkway. The reprogramming of traffic lights and installation of Safe Islands will increase pedestrians' safety when crossing the roads, especially for the elderly and children. It will also be helpful to reduce the occurrence rate of traffic accident. The school zone transformation at five primary schools will improve children's road safety, so as well for their parents and teachers. The improvement of two multi-modal stations will provide the passengers with a better and convenient travel experience whether taking bus, taxi or cars. It will also improve the accessibility of the disables.

40. The safer travel environment will promote more walk and bicycle riding, which is also good exercises for the health of local residents. The use of e-buses will reduce air pollution and thus good for health.

(3) Avoiding economic loss and protecting personal security from flooding and pollution

41. The ecosystem-based adaptation measures along Fuxing Middle Road, like swales, porous paving, subsurface detention or infiltration, will treat storm water, alleviate drainage and runoff pollution, and improve flood resilience as well as amenity value of street. The smart early flood warning system will warn the government, pertinent communities and residents to take measures as early as possible to avoid the loss of property, especially when the ground floor of buildings along Fuxing Middle Road are mostly taken by various kinds of shops or stores.

42. The sewage pipes upgradation in the community sub-project will resolve the flooding problem in some old communities. Local residents will not be bothered by the odour, mosquitoes, and travel inconvenience, especially in the raining days.

(4) Serving more patients with better hospital environment

43. The construction of a new Xiangtan Traditional Chinese Medicine Hospital will service more patients all over Xiangtan city, especially the elderly, as an important target. As a qualified green building, the new hospital will provide the patients with more indoor comfort/safety and better outdoor greening by using energy saving facilities and environmental friendly construction materials.

(5) Building a low-carbon, resilient, and livable life for local residents

44. The improvement of public facilities and other urban infrastructure at 20 urban communities will build a low-carbon, resilient, and livable life for local residents. The external wall and rooftop insulation, replacing energy-saving windows and doors, installation of solar hot water panel, and replacing water saving facets may help local residents to save their energy use and thus reduce the family cost. The installation of energy saving street/corridor lamps and repair of

broken roads will improve local residents' travel safety, especially for the elderly and the children. Installation of e-vehicle charging units for e-bicycles, installation of underground power cable, building ecological parking area, Installation of gas pipes all will bring local residents with more convenience for their life. Community greening will be good for the health.

45. According to the second survey, most local residents in the 20 communities think the improvement will benefit their life: better community environment (86.1% of 562 respondent), more convenience (78.8%), more safety (64.4%), and better for health (63.2%). Some think it will decrease the flooding possibility (17.6%), reduce the possible economic loss(17.6%), increase the employment (13.0%), and increase the housing value(10.7%).

(6) Providing local residents with employment opportunities

46. The construction of various sub-projects, e.g. lane modification, upgrading of cycling ways and pedestrian walkways, installation of Safe Islands and etc. will create new employment opportunities effectively increasing the income of the residents. According to the designing institutes responsible for the project FSRs, 2,430 employment opportunities, including 1,230 skilled jobs and 1,200 non-skilled jobs will be provided in the project construction period.

47. The project operation will also create new jobs. For example, the new Xiangtan Traditional Chinese Medicine Hospital will hire about 312 new staff. The new road parking management system will hire unskilled people to manage the parking and collect the parking fees. According to the designing institutes, 720 new jobs will be created including 570 skilled jobs and 150 non-skilled jobs.

48. Indirectly, the upgrading of the truck roads and feeder roads will promote the nearby business and real estate development, and thus will create more job opportunities in the pertinent industries, e.g construction, real estate agency, retailing, catering and etc.

C. Negative effects

49. The implementation of the project will not have permanent and serious negative impact on local residents or local development. But there might be some potential or temporary negative impact during the construction period, such as, traffic congestion, bus routes change, travel inconvenience, and environment pollution by construction. Besides, the bus fare or parking fee may increase and some community sub-components may need local residents to share a bit cost.

50. About 1/4 local respondents in the second questionnaire survey think the community sub-project has no negative impacts at all. The rest estimate that the project may cause the travel inconvenience (54.6%) and environmental pollution (34.9%) during the construction period. Some think they may need to share a bit cost (48.9%). Some (21.5%) worry that the rubbish sorting points may be set nearby their houses. Some think rubbish sorting as a burden (20.1%).

D. Residents' views about project-related issues

1. About the Project

51. Most of the respondents (76.6%) had no idea about the present project. The survey was the first time for them to know the whole Project.

Table 4-2: Respondents' Understanding of the Project

60. Do you know Xiangtan Low Carbon Transformation Sector Development Program before this survey?		
option	Frequency	Percent (%)
Know well	8	2.0
Know some	87	21.4
Don't know	311	76.6
Total	406	100.0

2. About transportation

a. About traffic congestion

52. Only 15.8% of respondents think the traffic congestion in Xiangtan City is serious. About 2/3 think it is somewhat serious. And the rest think there is no problem at all. In the FGDs, many interviewees either didn't traffic congestion is a big problem in present Xiangtan. But some car users said they sometimes met the traffic congestion, often near the bridges over Xiangjiang River connecting Yuhu District and Yuetang District. Bus drivers also reported Route 1, 3, 5, 23, and 24 are easy to meet traffic congestion during the traffic peak time.

Table 4-3: Views about traffic congestion in Xiangtan City

Option	**Frequency**	**Percent (%)**
Serious	64	15.8
Somewhat	273	67.2
No problem	69	17.0
Total	406	100.0

b. Residents' current travel patterns

53. More than 2/3 of questionnaire respondents travel 2 to 4 times per day. The major purposes of their first return trip is mainly for commuting between home and workplace (70.6%). The major purposes of their secondary return trip is mainly for shopping/catering (39.0%), exercises/sightseeing/amusement (30.5%), or escorting children to school (17.7%). Usually younger adults travel out for working while the elderly mainly for exercising. At the same time, parents or grandparents escort the children to school.

54. For the first trip for work, the usual travel distance is less than 5km (82.4%) while few above 15km (2.5%). It often takes less than 20mins (80.8%) while few over 30 mins (6.6%). It seems most employees' workplaces are not that far from their homes.

55. For the secondary trip for other purposes like shopping or exercising, most of the usual travel distance are also less than 5km (97.5%) and most take less than 30 mins (88.3%).

Table 4-4: Average daily travel times

36. How many trips do you take per day generally?		
Option	Frequency	Percent (%)
less than 2 times	90	22.2
2 to 4 times	280	69.1
more than 4 times	35	8.6
Total	405	100.0

Table 4-5: Major purpose of trips

37.1.a What are the major purposes of your trips?	**1st trip**		**2nd trip**	
Option	Frequency	Percent (%)	Frequency	Percent(%)
for home-workplace	283	70.6	4	1.2
for going to school	27	6.7	5	1.5
for escorting children to school	20	5	58	17.7
for business	7	1.7	19	5.8
for exercises/sightseeing/amusement	51	12.7	100	30.5
for shopping/catering	13	3.2	128	39
for visiting friends/relatives	0	0.0	14	4.3
Total	401	100	328	100

Table 4-6: Distance of trips

37.1.b The usual distance of one trip is _____Km	**1st trip**		**2nd trip**	
Option(Km)	Frequency	Percent(%)	Frequency	Percent(%)
Below 1	69	20.4	69	25.4
1-3	117	34.5	94	34.6
3-5	69	20.4	61	22.4
5-15	71	20.9	41	15.1
15-25	9	2.7	5	1.8
Over 25	4	1.2	2	0.7
Total	339	100	272	100

Table 4-7: Time spent for trips

37.1.c It takes ____mins.	1st trip		2nd trip	
Option(min)	Frequency	Percent(%)	Frequency	Percent(%)
Below5	42	12.4	49	17.9
5-10	98	29	87	31.9
10-20	131	38.8	63	23.1
20-30	44	13	42	15.4
30-40	12	3.6	14	5.1
Over 40	11	3.3	18	6.6
Total	338	100	273	100

c. Residents' travel tools

(1) Travel tools of respondents' households

56. Of all the 406 surveyed households, 59.6% have cars, 50.0% have electric bicycle, 20.7% have bicycles, and 14.0% have motorcars. About 6% households have two electric bicycles or cars.

Table 4-8: Travel tools of surveyed households

Option	Frequency	Percentage
Bicycle	84	20.7%
Electric bicycle	203	50.0%
Tricycle	5	1.2%
Electric tricycle	7	1.7%
Motorcar	57	14.0%
Traditional cars	235	57.9%
New energy cars	7	1.7%

(2) Main travel means of the Respondents

57. The main travel means of the respondents are walking (32.6%), bus (19.5%), self-owned car (17.8%) and electric bicycles (17.6%). The elderly often take public bus, with very few driving car or riding electric vehicles. Only a few (2.1%) take public bicycles as the main travel means. Few people (0.2%) go to the workplace by car sharing with their friends, relatives or neighbours. In the FGDs, the interviewees explained the reasons like the colleagues or friends may not live nearby, the neighbours' workplace are not in the same direction, and it is troublesome to calculate the fares to share.

Table 4-9: Main travel means of the respondents

38. What are the major ways of your daily trips?		
Option	Frequency	Percent (%)
Walking	256	32.6
Bicycles	21	2.7
Public bicycles	19	2.4
Electric bicycles	138	17.6
Electric tricycle	7	.9
Motorcycle	15	1.9
Self-owned car	140	17.8
Riding with friend, relative, or neighbor in their car	1	.1
Private car through Didi app	30	3.8
Traditional taxi	5	.6
Bus	153	19.5

58. When selecting travel means, respondents' concerns are: convenience (53.1%) > speed (15.3%) >cost (12.6%) > comfort (9.3%) > safety (6.7%) > environment protection (%) > low carbon (%). The result shows that local residents concern about their personal needs when selecting travel means, rather than considering of the public demands for environment protection and low carbon. It also shows that safety and cost are not big issue for local residents.

Table 4-10: Residents' concerns when selecting travel means

41. In general, what do you consider First when choosing the ways of transportation?		
Option	Frequency	Percent (%)
Cost	84	12.6
Convenience	355	53.1
Speed	102	15.3
Comfort	62	9.3
Environmental protection	13	1.9
Low carbon	7	1.0
Safety	45	6.7

(3) About walking

59. In the FGDs, the interviewees complained about (i) the inconvenience, e.g. the pedestrian walkways are often occupied by the disorderly parking cars/electric bicycles/motorcars and thus the pedestrians have to bypass the cars/electric bicycles. Zebra lines become narrower when arriving the green belt or meeting trees/facilities and thus slow the pedestrians. Zebra lines are occupied by the electric bicycles waiting for the traffic lights. (ii)the unsafety. They felt unsafe when passing through the road without traffic light, when the time for green lights is too short, when meeting the fast right-turning cars/motorcars when crossing the zebra lines, when pedestrians and electric bicycles riders have to share the road without sidewalk, and when they have to walk in the mid of the road which has no sidewalks and half is occupied by the parking cars.

60. The interviewed disabled and the elderly using wheelchairs complained that (i) parking cars or electric bicycles or motorcars often occupy the narrow pedestrian walkways, even the sidewalks for the blind. (ii) It is difficult for the disabled or the elderly who use wheelchairs to get access to some pedestrian walkways which are higher than the flat road but without slope or the slope is too narrow for the wheelchairs. (iii)There are often barriers on the zebra lines, on the ways to the park, the hospital or shopping mall. Even, some special accessibility ways are occupied or locked by various reasons.

61. These situations were also observed by the survey team and the specialists, see the following photos.

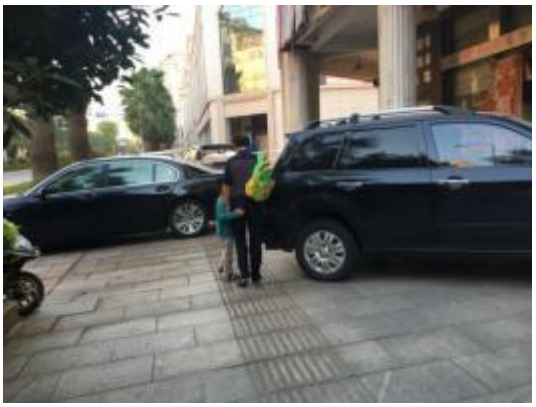

Fig 4-1: Disorderly parking cars

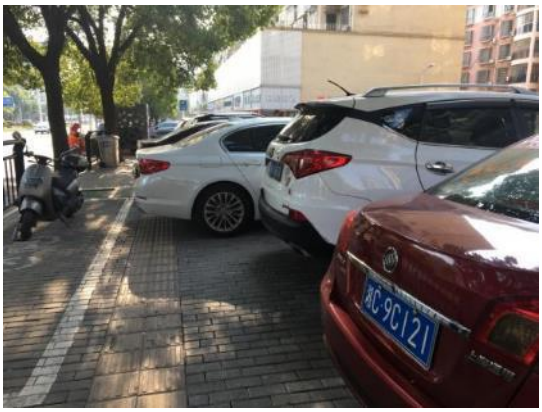

Fig 4-2: Parking cars occupy the lane for the blind

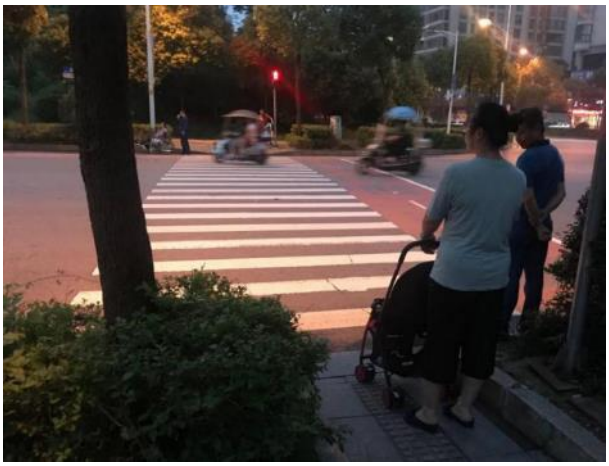

Fig 4-3: Zebra lines became narrower at the end

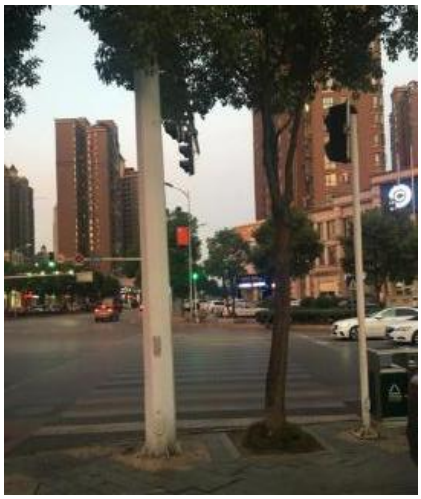

Fig 4-4: Zebra lines meet tree/pole at the end

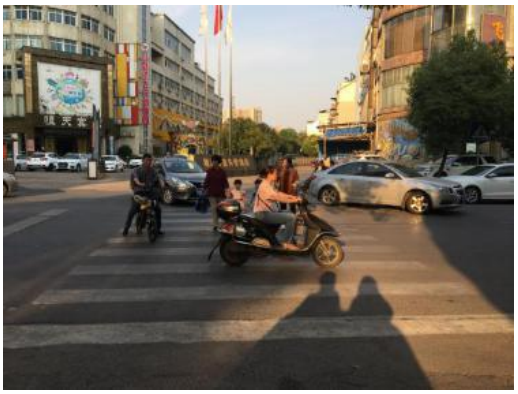

Fig 4-5: Pedestrians crossing the road without traffic lights

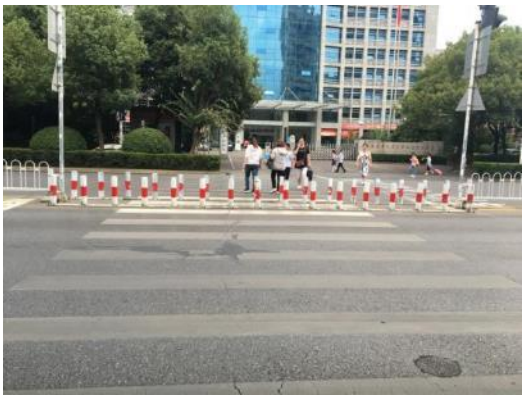

Fig 4-6 Barriers on the zebra lines

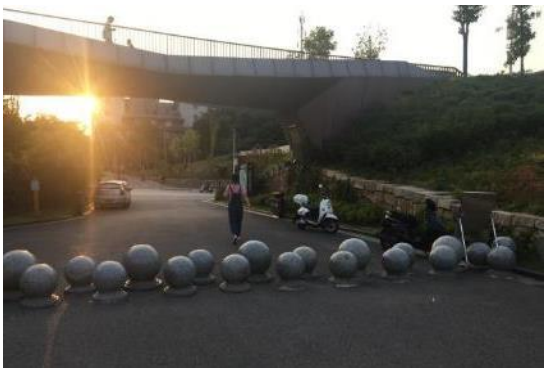

Fig 4-7: Barriers on the road to the park

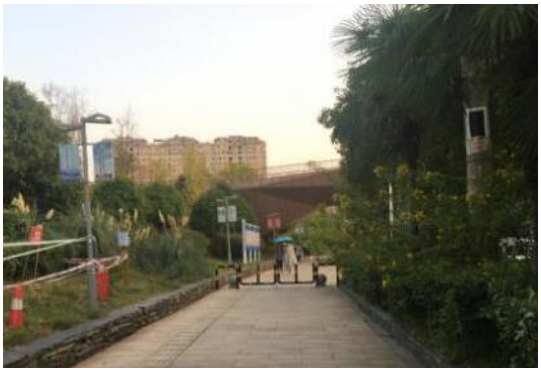

Fig 4-8: Barriers locked on the road to the park

(4) About bus

62. Of the 406 respondents, 38.7% has bus card. The number seems low considering that 93.8% of the respondents are local permanent residents. In the FGDs, the interviewees said that they preferred to walk or take electric bicycle if the distance is less than 3km or 30mins. If it is further, they would take bus, car or taxi. Some young interviewees also said that they use Alipay App to pay the bus fares directly. It is convenient and they need not to get the bus card.

63. Young residents also reported that they use the famous Gaode Map or Baidu Map App in their smart phone to get the information of public transport. These Apps can tell them how to take the right bus routes, when the bus will arrive, time of the first and the end bus, and alert them when to get off. They thought these Apps are powerful enough that they didn't install the local transportation App. However, not many elderly people are familiar with these Apps.

64. The main reasons for not often taking the public bus are: taking self-owned electric bicycle, motorcycle, private car, or shuttle bus are more convenient than taking bus (26.5%) , no need to take the bus because of short distance (22.7%), far from bus station (15.6%), long time wait for bus (12.3%) and slow bus speed (6.8%). It seems the present project can contribute to solving the later three problems.

65. In the FGDs, some interviewees said that it is crowded during the traffic peak time and it often takes long time to wait. Some complained that there are limited choices of bus routes and

insufficient buses. Some said the end time for some bus routes are so early that it is inconvenient to travel by bus at night. Some said the seats in the bus stops are too narrow or too dirty sometimes. Some complained that the sun/rain shades of the bus stops are too narrow or even no sun/rain shades. Some said the information of bus routes changes had not been updated/released widely in time, which made them waste time in waiting or take the wrong buses.

66. Specially, the disabled and the elderly said that there are steps in both the front getting-on part and the middle getting-off part in almost all the buses, which is inconvenient/difficult for the disabled or the elderly to get on and off the bus. They also complained the poor service of some bus drivers who are very impatient to wait for them when getting on and off.

Table 4-11: Main reasons for not taking the public bus

39. If not by bus, what are the main reasons?		
Option	Frequency	Percent(%)
1.far from bus station	57	15.6%
2.too crowded in the bus	16	4.4%
3.waiting too long for a bus	45	12.3%
4.Poor service of bus staff	5	1.4%
5.Slow bus speed	25	6.8%
6.Need to transfer many times	10	2.7%
7.Short distance and no need to take a bus	83	22.7%
8.Unsafe to ride the bus	1	0.3%
9.Don’t know how to ride the bus, e.g. routes	7	1.9%
10.Want to exercise	10	2.7%
11.Take self-owned electric bicycle, motorcycle, private car, or shuttle bus, more convenient than bus	97	26.5%
12.Other, please specify	10	2.7%
Total	366	100.0%

Fig 4-9: Narrow seats

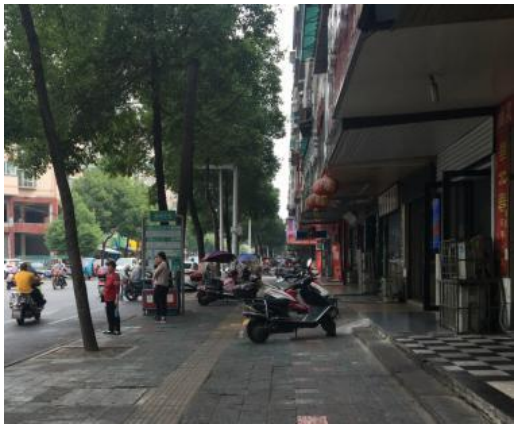

Fig 4-10: Bus stop without sun/rain shade

(5) About electric bicycle riders and cyclists

67. Of all the 406 surveyed households, 50.0% have electric bicycles, 20.7% have bicycles, and 14.0% have motorcars. 4.0% and 7.6% households have over one bicycle and electric bicycle respectively.

68. Many interviewees attended the FGDs by riding their electric bicycles. They said it is easy, cheap and convenient for short distances. Comparing with bicycle, it saves the human power. Comparing with the motorcar, it is cheaper for recharging electricity rather than using the gasoline. Also it is safer for the speed is slower and less accidents. In Xiangtan city, many local residents installed the sun/rain shade on their electric bicycles although it is in fact not allowed by the traffic police department. However, it does help to make full use of electric bicycle even in the hot sunny days or raining days.

69. Of the 406 respondents, 18.7% frequently use, 38.9% sometimes use and 42.4% never used the public bicycle. 14.3% have Yong'an'xing App and 5.4% have Public bicycle membership card for renting public bicycle. Also some interviewees said they also can use Alipay App to rent the public bicycle and thus they need not to install Yong'an'xing App or apply for the membership card. Many young interviewees were satisfied with the public bicycle service. They thought it is convenient to borrow and return. It is also suitable to use for short distance unnecessary to take a bus. Specially it is free in two hours. They need not to buy their own bicycles and worry about the bicycles being stolen. However, the elderly seldom use the public bicycle. Some have their own bicycle. Some are not familiar with the smart phone and Apps.

70. The main reasons for not often walking or taking bicycles are: too long distance (33.5%), too tired (22.0%), unsuitable weather (20.7%), too much time (12.3%), and unsafe road (4.4%). Although unsafe road is not an important reason for not often walking or taking bicycles, some interviewees did report that they felt unsafe as pedestrians or cyclists when they have to share the road with motorcars and cars.

71. In the FGDs, some interviewees as the cyclists or electric bicycle riders complained that the pedestrians cross the roads randomly, the cars often occupy the cycling ways or side ways, and the parking cars occupy half of the roads. Some also worried about the fire risks since some residents living at higher stories privately pulled the wires to recharge their electric bicycles. Some said it is more difficult to ride a public bicycle than ordinary one. Either, the public bicycle has no back seat and thus they cannot carry their children or deliver some heavy stuff.

Table 4-12: Frequency of public bicycle use

43. How often do you use the public bicycle		
option	Frequency	Percent(%)
Frequently	76	18.7
Sometimes	158	38.9
Never used	172	42.4
Total	406	100.0

Table 4-13: Main reasons for not often walk or riding bicycles

40. If not by walk or bicycles, what are the main reasons?		
Option	Frequency	Percent (%)
Too long distance	76	33.5
Cost too much time	28	12.3
Too tired	50	22.0
Unsuitable weather, e.g. rainy, too sunny, windy, cold, etc.	47	20.7
Unsafe road, e.g. too many motor vehicles, too fast, no special lane, narrow pedestrians, etc.	10	4.4
Poor road or traffic facilities	4	1.8
Inconvenient to charge electric bicycles	3	1.3
Few friends, colleagues, or neighbours walk or ride their bike	2	.9
Other, please specify	7	3.1

Fig 4-11: Electric bicycles with sun/rain shade

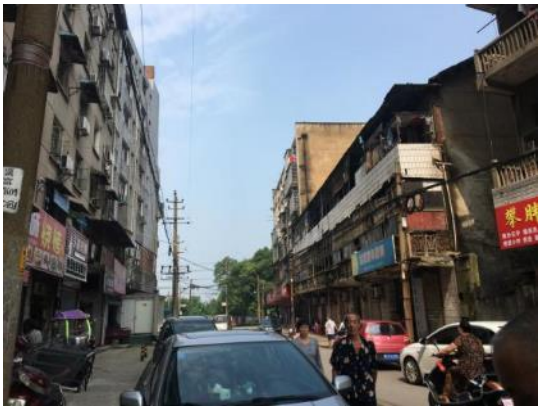

Fig 4-12: Cars parking in both sides of the road

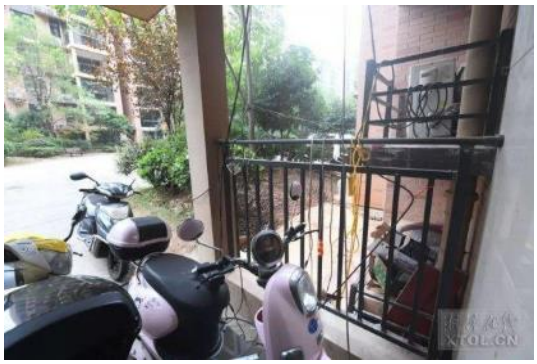

Fig 4-13: Residents privately pulled the wires to recharge their electric bicycles

(6) About cars

72. Of all the 406 surveyed households, 59.6% have cars and 7.1% households have over one car. Although some interviewees said they don't use the cars for commuting considering of

the gasoline price, parking difficulties, and sometimes traffic congestion, cars are still important travel tools for local people.

73. In the FGDs, the interviewees explained the reasons why they bought the cars: it is convenient to go anywhere for shopping or travelling by cars for a whole family. They need not to stay in the crowded bus during traffic peak time. They need not worry about bad weathers like taking electric bicycles or motorcars. Some also explained that it is for 'face' reason in present China. Owning a car is a symbol of a family's financial capacity. Some young men need to have a car to attract the girls.

74. 58.4% of the private car owners has dedicated parking space in their neighborhood while only a few (6.3%) have in their workplace.

75. In the FGDs, the interviewed car owners complained there are no enough space in the old urban area for parking and they have to park on the roads or occupy the pedestrian sideways. They also complained the pedestrians or electric bicycle riders who often cross the roads randomly or run a red light, disobeying the traffic rules. Sometimes the motorcar or electric bicycle riders occupy the car lane. Especially some often park in front of the cars when waiting for the traffic lights, which slow the car speed and are unsafe. Sometimes the motorcars or electric bicycles run on the one-way road conversely.

Fig 4-14: Electric bicycles parking in front of the cars, and on the zebra line

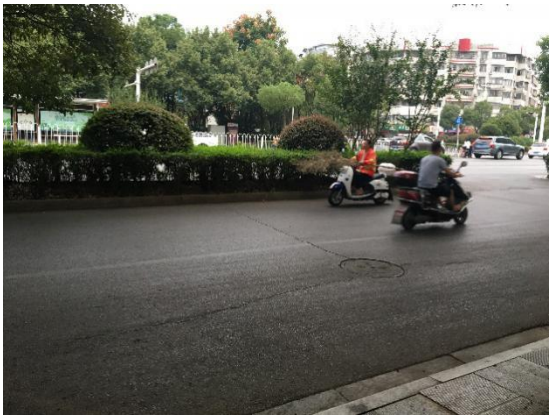

Fig 4-15: Electric bicycles running conversely on a one-way road

76. When asking about the importance of factors that will affect the use of cars, the survey result shows that gasoline price (33.5%) and parking vacancies (31.7%) are the most important, then the degree of traffic congestion (27.4%) , parking costs in congested areas (23.0%) like the city center or business district, and parking costs in other areas (18.3%). It seems that the increase of parking rates, especially those in congested areas, may decrease the use of cars. The relief of traffic congestion and the increase of car parking plots may increase the use efficiency of cars.

Table 4-14: Factors affecting the use of cars

Change of	Important impact (%)	Some impact(%)	No impact(%)
Gasoline price	33.5	45.2	21.3
Parking costs	18.3	57.0	24.8
Parking costs in congested areas	23.0	59.1	17.8
Parking vacancies	31.7	59.6	8.7
Degree of congestion	27.4	62.2	10.4

(7) About green travel

77. Nearly 2/3 respondents agree with green travel and would like to practice by themselves. Few think it is non sense. The interviewees expressed that green travel is meaningful for the environment and the earth. It is also good for health. Thus they would like to use less cars and walk more as doing exercises.

78. But still about 1/3 appreciate the idea of green travel but could not do it because of various reasons. Some interviewees said the distance between home and workplace is far or they don't like squeeze in the crowded buses.

Table 4-15: willingness to green travel

49.What is your opinion on green travel		
option	Frequency	Percent(%)
Very supportive and will do my best	251	61.8
The idea is very good, but I do not often do it.	140	34.5
Non-sense	11	2.7
I don't know	4	1.0
Total	406	100.0

79. When distance allows, the respondents prefer the green travel way of walking(63.5%) first, then bus (12.2%) and bicycle (10.1%) next. It is strange to see that not many respondents chose electric vehicles. It is estimated that some respondents are confused about whether riding electric vehicles is green or not.

Table 4-16: Preferred ways of green travel

50. What ways of green travel do you prefer if the distance allows?	Frequency	Percent(%)
50.(1)Walking	240	63.5
50.(2)Bicycle	38	10.1
50.(3)Electric vehicle	26	6.9
50.(4)Bus	46	12.2
50.(5)Choose smaller car	16	4.2
50.(6)Car pool	11	2.9
50.(7)Others, please specify	1	0.3
Total	378	100.0

80. The reasons for selecting the green travel ways are: convenient and fast (28.6%), as exercises (27.4%), not tired (24.3%), and affordable (14.2%). The order of the selection reasons is also compatible with the respondents' general attitude of selecting travel ways. The respondents concern most about convenience (53.1%), then speed(15.3%), cost(12.6%), comfort(9.3%), and safety (9.3%). Few respondents concern about environmental protection or low carbon issues. (see Table 4-17).

Table 4-17: Reasons for selecting green travel ways

50.1 Reasons for selection?	Frequency	Percent(%)
50.1.(1)more affordable	78	14.2
50.1.(2)easier, not too tired	133	24.3
50.1.(3)Doing exercises while travelling	150	27.4
50.1.(4)more convenient and fast	157	28.6
50.1.(5)more comfortable	10	1.8
50.1.(6)safer	6	1.1
50.1.(7)No damage to the environment	13	2.4
50.1.(8)least time	1	0.2
Total	548	100.0

3. About green building

(1) Understanding of green building

81. The survey result shows that the respondents have certain understanding of green building. Most of them (78.3%) know that green building are energy-saving, water-saving, energy-saving, environmentally protective and ecological. About half respondents think that green building should have better greening, non-toxic and environmentally friendly. However, only a few respondents (21.9%) think high technology could be used in green building.

Table 4-18: Local residents' understanding of green building

55. What do you think of green building?	Frequency	Percent(%)
55.(1)Buildings with better greening in the community	207	51.0
55.(2)Buildings using high-tech technology	89	21.9
55.(3)Energy-saving, water-saving, energy-saving and environmentally protective ecological buildings	318	78.3
55.(4)Non-toxic and environmentally friendly building	204	50.2

(2) Civil green building

82. About civil green building, the respondents concern about the following characteristics: energy saving facilities (28.3%), indoor comfort (25.4%), safe building materials (21.9%), and outdoor greening environment (19.6%). Only a few (4.5%) concern about the impact at the macro level, such as on global environment.

Table 4-19: Concerns about civil green buildings

56.If you buy a house in the future, what are the Top three characteristics of green building that you prefer?		
option	Frequency	Percent (%)
Indoor comfort, such as air quality and ventilation, thermal comfort, lighting, noise, etc.	241	25.4
Power saving, water saving, and heating saving facilities	268	28.3
Environmental protection and health and safety of building materials used	207	21.9
Outdoor greening environment	186	19.6
Impact on global environment, such as CO2 emissions, waste recycling, etc.	43	4.5
Others, please specify	2	.2
Total	947	100.0

83. Obviously, the understanding of green building lead to the respondents' preference to commercial housing of green building. 78.8% of respondents look at the green building as an advantage.

Table 4-20: Preference of green building

57.If the real estate developer advertises the property as green building, will it increase your purchase preference?		
option	Frequency	Percent (%)
Yes	320	78.8
No	86	21.2
Total	406	100.0

(3) Willingness to pay

84. Although most respondents look at the green building as an advantage, they still concern about the price. Most respondents (74.1%) only accept the price increase of less than 3% (see Table 4-21) for green building. 18.0% can accept the increase between 3~5% while a few can accept the increase over 5%.

85. In fact the FGDs interviewees also said that green building is not the decisive factor when selecting the house. Location, housing price, and amenities may be more important.

Table 4-21: Willingness to pay for commercial housing of green building

58. If the real estate developer strictly follows the standard of building the green building and can meet the quality requirements, how much at most are you willing to pay more based on the normal house price?		
option	Frequency	Percent (%)
Less than 3%	301	74.1
3%~5%	73	18.0
5%~8%	21	5.2
8~10%	11	2.7
Total	406	100.0

4. About urban resilience/flooding

86. Of 406 respondents, 80.0% think to reduce global warming is very important and nobody think it is unimportant.

Table 4-22: Attitude to reduce global warming

6.3 Reduce/prevent global warming		
option	Frequency	Percent (%)
Somewhat Important	16	3.9
Important	65	16.0
Very Important	325	80.0
Total	406	100.0

87. In the Xiangtan City Urban Drainage Flood Control Planning (2015-2020), the flooding status and the sites prone to be flooded were identified. After several years' implementation, the urban flooding has been reduced a lot.

88. In the 21 FGDs held in Xiangtan, interviewees were asked whether there are any places prone to be flooded in their communities. Two suburb rural communities reported that their vegetable lands have been flooded before, but not seriously. One urban community reported some shops have been flooded before because of the block of drainage pipes without in-time clearing for financial shortage. Some randomly interviewed taxi drivers identified some sites like the north Jianshe Road. However, during the second survey in the February of 2020, some community managers reported their drainage problems, e.g. Longzixiang Community. Shangshuxiang Community and Wanxin Community managers also said that some area in their communities often suffer from flooding during the raining season, e.g. travel inconvenience, odour and more mosquitoes.

89. When talking about possible flooding because of global warming and potential extreme rainstorm, most interviewees were optimistic. They believed that the government will deal with the flooding issue and help them when necessary. When talking about what they can do to increase urban climate resilience, most interviewees agreed with more greening, but many didn't agree with greening on the roof or on the wall. They explained the reasons like: many property management companies do not allow the residents to plant on the roof. Some housing are very old and the top roof cannot afford the weight of plants and watering. Residents of top floor worry about the leaking problem and do not welcome the greening on the roof. The vertical greening on the wall is either not feasible because it is easy to attract the snakes and insects. Some new residential zones have the landscape water system including the fountains. A few has water wall. But some has stopped running for cost issues.

5. About energy use

90. Low carbon lifestyles have six domains including homes, transportation, products, food, leisure and services[1]. Homes, transport and food represent more than 80% of the total greenhouse gas that the lifestyle of an average Chinese citizens produces per year. In 2017, the average lifestyle carbon footprint in China per person is 4.3 tons CO2/year, of which, 1.4 from homes, and both 1.1 from transport and food. Thus here home energy use will be focused on.

[1] Food means consumption of food and beverages. Homes means house/apartment and supply of utilities. Transport means for commuting, leisure, and other personal purposes. Products means goods and materials purchased by households. Leisure means sports, culture, entertainment, hotel services. Services means insurance, communication and information, cleaning, etc.

91. Almost all questioned households (98.5%) have individual meters of energy consumption. In the FGDs, the interviewees said only few old residential zones or entities still use collective meters.

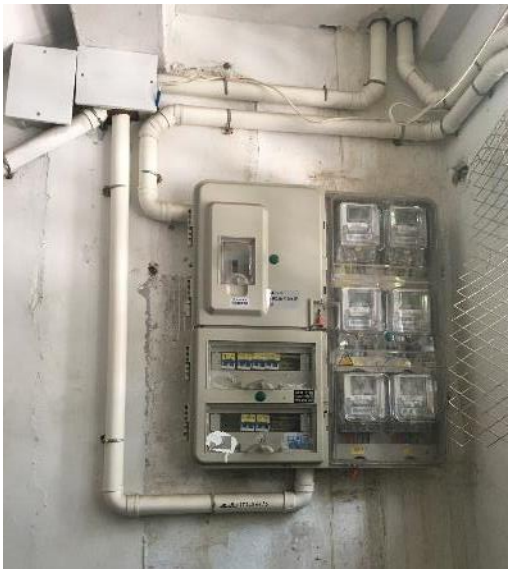

Fig 4-16: Electricity meters

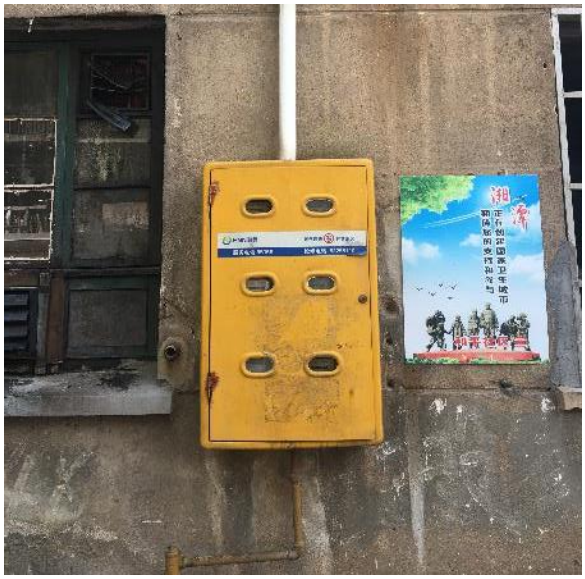

Fig 4-17: Gas meters

Fig 4-18: Water (blue) and gas (yellow) meters

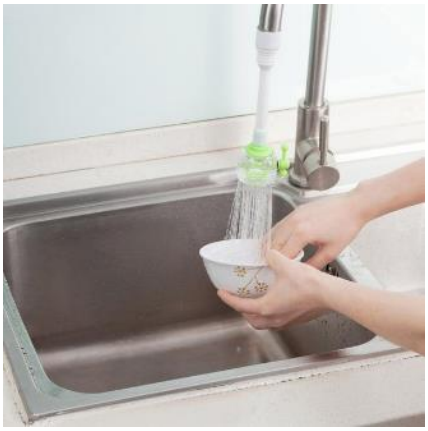

Fig 4-19: Water saving faucet

92. Water: Xiangtan City has Xiang River and thus local residents have no problem of water shortage. However, many interviewees in the FGDs are still traditionally thrifty. They introduced their efficient water use methods. Many households prefer the multiple use of water. They wash the rice first, then rinse the vegetables, then use the same water to flush the toilet. They prefer to wash simple clothes in the summer rather than use washing machine. The used water will also be kept to flush the toilet.

93. Gas: Most urban residential zones are supplied with natural gas. Local residents mainly use natural gas for cooking and water boiling. They said gas is better for stir-frying dishes than induction cooker. Also using gas is cheaper than using electricity. Even, some interviewees bought energy-saving stoves. Many interviewees use gas water heater for showering. A few residents living at the top floors would like to use solar water heaters while the residents living at

the low floors would not choose it. They worried about the heat loss and low effect in the winter and rainy days. Some interviewees installed electric water heater. But some said it is not suitable for big family.

94. Electricity: Electricity is mainly used for heating or cooling, lighting, electric cooker or kettle. Most interviewees reported that the cooling cost in summer is the most in one year (averagely CNY 831.6 per household), then the heating cost in the winter (averagely CNY 467.0 per household). According to the interviewees, December, January and February are the coldest period in one year while June, July and August are the hottest.

95. Since Xiangtan is located in middle of China, local people's feeling about cold winter is not that strong. In the survey, about half respondent thought the winter cold is neutral and bearable. 31.8% thought the winter is relatively cold while 12.3% thought it is very cold (see Table 4-23). In the winter, 89.2% of 406 households have electric appliances for heating. Local people prefer to put a special heating under the table rather than use air conditioner. They think the heating effect of air conditioner is not good enough and costly. Local residents know how to save the electricity. Most of them (89.1%) only heat the rooms where someone are presently staying.

96. The percentage of the respondents who expect the central heating and who deny is similar, both about 40%. The rest would make the decision on some conditions. In the FGDs, the interviewees concerned about the service and price. Some doubted about the central heating by referring to the conflict cases between property management companies and residents occurred in Changsha City on TV news. Some said that a few residential zones in Xiangtan City have the central heating system but they heard that the effect is not good enough. Of all the 406 respondents, 8 said they are using central heating and 6 are unsatisfactory mainly because of high cost. It seems that central heating is not that a desired proposal for local residents.

Table 4-23: Residents' feeling about Xiangtan's winter

23.What is your feelings of Xiangtan's winter?		
option	Frequency	Percent (%)
Very cold	50	12.3
Relatively cold	129	31.8
Neutral	186	45.8
Not too cold	39	9.6
Not cold at all	2	.5
Total	406	100.0

Table 4-24: Demand for central heating

28. If your home did not use central heating, do you need central heating?		
option	Frequency	Percent (%)
Need	163	41.0
Don't need	173	43.5
I Don't know, it depends on	62	15.6
Total	398	100.0

97. Most respondents (92.6%) use air conditioner in summer. Many interviewees in the FGDs said they can bear the cold in winter but cannot bear the hot in summer. That is why the

proportion of respondent who accept central cooling is higher than that of central heating (See Table 4-25).

98. Especially, since there are two months for summer holiday and children and the elderly have to stay at home more than usual, local households have to consume more electricity in summer than in winter. Local residents also know how to save the electricity. Most households (89.9%) only cool the rooms where someone are presently staying, generally the living room in the daytime for the elderly and children, then the bedrooms at night. Some said they only turn on the air conditioner in the living room when the guests visited since its power is much higher than those in the bedrooms. Many interviewees said they would set the temperature at 26℃ or above. They also said they would turn off the air conditioners when the indoor temperature is cold enough, or about twenty minutes before their going out for walking or exercises. Some households bought the variable frequency air conditioner which they thought as more energy-saving. Some often choose the 'energy saving' mode of their air conditioners. Some always keep the windows and doors closed when using the air conditioners.

Table 4-25" Acceptance of central cooling

33. Can you accept central cooling?		
option	Frequency	Percent (%)
Yes	234	57.6
No	133	32.8
I don't know, it depends on	39	9.6
Total	406	100.0

99. In the FGDs, some interviewees talked about the insulation of their housing. The old residential buildings often have no thermal insulation layer and thus they are low efficient to keep warm or cool. According to the survey, more than 2/3 housing were built ten years ago, within it, about 1/3 twenty years ago and about 11% thirty years ago (see Table 4-26). It seems some measures could be taken to help improve the thermal insulation efficiency of these old buildings.

100. Community managers also confirmed this point. For example, 67 residential buildings in Baofeng Community were built in the 1990s. 37 residential buildings in Wanxin Community were built in the 1970s or 1980s while 24 in the 1990s. The rooftop of these old buildings are facing the leakage problem. Some outer walls are peeling and the insulation effect is obviously low. Also, some windows in the public area of these buildings are broken. Community managers added that some old or poor families are still using the old wooden or plastic aluminium doors and windows, easily for the wind leakage.

Table 4-26: Housing built time

21. When was your home built		
Option(year)	Frequency	Percent (%)
Before 1990	46	11.3
1990- 2000	88	21.7
2000-2005	67	16.5
2005-2010	76	18.7
2010-2015	98	24.1
After 2015	31	7.6
Total	406	100.0

101. With local government's financial support in building 'Two-oriented society', some communities has installed energy-saving street lamp, e.g. with solar panel. Many households in these renovated communities have replaced their original incandescent lamps with energy-saving ones by the purchase with subsidy or distributed by the community cadres or by exchange of their waste materials/old lamps. Some interviewees updated the energy-saving bulbs by themselves. However, still many are using the original ordinary lamps. Some community managers (e.g. Shanshuxiang Community, Jintang Community, Longzixiang Community, and Xiaguang Community) reported that they are short of street lamps. More community managers said some old buildings have no or broken public lights in the corridors. It is unsafe for local people to walk in the evening, especially for the elderly.

102. Besides the home energy use, many interviewees in the FGDs referred to the importance of promoting the energy saving in the workplace. They said that people concern about home energy use because they have to pay the bills by themselves. However, at the workplaces, employees may not have the same willingness to save the energy since the water, electricity and printing paper are all public. They might keep using air conditioner all the time, set the temperature too high or too low even with the windows open, waste the printing paper and other consumables, not turn off the lights when they left, and etc.

6. About community infrastructure

103. Besides the problems described in other sections like the old residential buildings without external wall and rooftop insulation, with rooftop leakage, with no or broken public lights in the corridors, with old windows and doors, the public infrastructure in the proposed communities are also poor. Community managers reported the broken roads, the broken street lamps, the drainage problem, no gas supply in some area, short of greening and exercise area, especially for the elderly and children, short of parking plots, the fire risk of residents' privately pulling the wires to recharge their electric bicycles, and etc.

7. About participation

104. The degree of the respondents' involvement in public activities is: environment protection campaign/education (31.0%) > green transportation campaign/education (11.7%) > low carbon campaign/education (7.6%) > public Hearings for tap water/solid waste tariff (3.7%). In fact about half respondents (45.2%) have never actively participated in any public activities.

Table 4-27: Public activities involvement

62. Have you previously participated in any public activities like…?	Frequency	Percent (%)
62.(1)Low carbon campaign/education	35	7.6
62.(2)Environment protection campaign/education	143	31.0
62.(3)Public Hearings for tap water/solid waste tariff	17	3.7
62.(4)Green transportation campaign/education	54	11.7
62.(5)Others, please specify	4	0.9
62.(6)None	209	45.2
Total	462	100.0

105. The survey result also shows that about half families have never actively participated in any public activities. Of those families who attended, children are an important group, see the table below. In the FGDs, many interviewees agreed with the importance of educating the children. They said that children often learn new concept in the school like global warming,

environment protection, low carbon, green travel, energy saving and etc. The teachers often assign the children the pertinent homework and the parents/grandparent have to help the children. This is an important side effect for the whole families to learn and practice.

Table 4-28: Family members engaged in public activities

63. If choose 'none' in last question, Who in your family are mostly engaged in such activities?		
option	Frequency	Percent (%)
Adult Female	8	3.9
Adult Male	3	1.4
Elderly Female	1	.5
Elderly Male	3	1.4
Children	43	20.8
No special person, it depended on who had time	46	22.2
Nobody	103	49.8
Total	207	100.0

106. Of various measures, about 2/3 respondents thought the media publicizing is the most effective way in raising the public awareness of low carbon lifestyle. Special promotional activities (15.0%) will also contribute, and then training (7.4%), post (5.2%) and booklet (3.4%) will play their roles.

Table 4-29: Effectiveness of various measures

64. Which measure do you think will be the MOST effective to raise the public awareness of low carbon lifestyle including consumption, travel and etc.?		
option	Frequency	Percent (%)
Training	30	7.4
The media publicizing	266	65.5
Post	21	5.2
Booklet	14	3.4
Special promotional activities	61	15.0
Others, please specify	14	3.4
Total	406	100.0

107. About half of the respondents prefer to be involved in low carbon related activities through watching TV publicizing, then 18.7% and 17.7% would like to attend the unit-organized and community-organized activities respectively.

Table 4-30: Activities to be involved in

65.Which activity is the MOST possible for you to be involved in?		
option	Frequency	Percent (%)
Receive training	23	5.7
Receive the booklet	23	5.7

Watch TV publicizing	199	49.0
Read the post	8	2.0
Your community-organized activities	72	17.7
Your unit-organized activities	76	18.7
Others, specify	5	1.2
Total	406	100.0

E. Residents' demands for the Project

1. Residents' attitude

108. Table 4-31 reveals the respondents' attitude to the sub-project proposal. They prefer green travel > green building > central cooling > central heating.

Table 4-31: Residents' attitude to sub-projects

Item	Unnecessary	Somewhat necessary	necessary	Very necessary
Green travel	1.2	10.8	47.3	40.6
Green building	6.2	21.7	40.6	31.5
Central cooling	35.5	25.6	25.1	13.8
Central heating	40.1	24.1	22.9	12.8

2. Residents' expectation

(1) For transport

109. **Pedestrians**: Interviewed pedestrians expected to improve their convenience and safety. About the disorderly vehicle parking, they wanted the government to take measures. For example, government should educate the vehicle owners to park their vehicles at the right place. Otherwise, the vehicle owners should be fined for their disorderly parking behavior. Surveillance camera could be set to monitor those behaviors. Some staff could be hired to specially deal with the road parking issue.

110. For crossing the roads more safely, some interviewed pedestrians expected the traffic lights should be installed in the places of zebra lines as many as possible. Some suggested to install 'smart' traffic lights they heard from news, whose pole has a button for the pedestrians to press when they want to cross the roads. Some wanted the longer time setting of green light to allow the pedestrians to cross the road unhurriedly. Some suggested that more traffic lights should have time display and voice alert, which is also good for the disabled who are deaf or blind.

111. The disabled and the elderly using wheel chairs wanted less barriers on the roads, zebra lines, channels, and pedestrian walkways. They specially wanted less steep and wider curb ramp. One handicapped person expected more benches along the pedestrian walkways for the disables to have a rest.

112. **Bus passengers**: Interviewed residents expected for better bus service, e.g. more bus

supply, especially during the traffic peak time, shorter waiting time, more bus and longer service at night, and bus drivers' better attitude to the passengers. Specially, the disabled and the elderly using wheelchairs expected for the buses without inside stairs.

113. Passengers also expected the updating of bus stops, e.g. wider platform, wider and more seats, more sun/rain shades, electronic screen displaying the arriving time of the coming buses which is also good for the elderly who is unfamiliar with mobile Apps, and bars set in some crowded bus stops to keep the passengers in order and safe.

114. **Electric bicycle riders and cyclists**: Interviewed residents suggested to educate the pedestrians who cross the road randomly and the car owners who park the car disorderly or drive on the wrong lane. They also suggested that the fine might be a useful way.

115. Specially, electric bicycle riders expected to set recharging points in their communities for convenience and safety. Community managers of Jintang, Wanxin, Banbianjie, Daqiao, Sanjiaoping, and Xiaguang communities all confirmed this demand. Some public bike cyclists wanted the public bikes to have back seat. Some expected more public bike stations, particularly in the suburb area or nearby the university or college. Community managers of Jintang and Banbianjie also confirmed this demand.

116. **Car/bus drivers**: car drivers, especially those living in the old areas, expected to have more parking plots for convenience. They wanted the government to more educate the pedestrians not to run a red light or cross the road randomly. They also wanted the government to more educate the electric bicycle riders to know the danger of using the car lane randomly. They suggested serious fine as effective punishment. Also traffic policemen should strengthen managing pedestrians and electric bicycle riders. If there are no enough traffic policemen, more auxiliary policemen or volunteer can help.

117. Bus drivers also expect the pedestrians and the electric bicycle/motocar riders to obey the traffic rules. They suggested the traffic policemen to more regulate them and set more traffic signs, lines and lights. They expected the bus passengers to increase their self-protection awareness in the bus, concern about the sanitation, give seats to the vulnerable people, press the getting off button earlier for their timely response, and etc.

(2) For urban resilience/flooding

118. For the potential flooding risk, the interviewees expected the government to take preventive and effective measures, such as conducting reliable research, upgrading the facility like installation of wider rainwater and drainage pipes, regularly checking the status of pipelines, warning the residents in advance, and etc.

(3) For green building

119. The preferential policies that the respondents expected when they buy the commercial housing of green building are: house price discount (43.5%), concessions of loan interest rate (17.9%), deduction of deed tax and stamp duty (14.0%), decrease of down payment ratio (12.4%), and increase of the housing fund loan(12.0%).

Table 4-32: Preferential policies expectation

59. If the government encourages the consumers to buy green building, which of the following preferential policies do you most want?		
option	Frequency	Percent (%)
Concessions of loan interest rate	147	17.9

Increase of the housing fund loan	99	12.0
Discount of house price	358	43.5
Decrease of down payment ratio	102	12.4
Deduction of deed tax and stamp duty	115	14.0
Other policies	2	.2
Total	823	100.0

(4) For energy use

120. The FGDs interviewees thought it would be good if the government could take measures to improve the insulation status of their old housing, e.g. apply new insulation materials on outer walls or roofs. Even, they could pay the cost partially. They also suggested that measures should be taken to stop the energy waste in the workplaces, especially those non-private ones.

121. The following table shows the extent of local residents' demand for potential project sub-component of household energy saving. They prefer external wall and rooftop insulation >replacing water saving facets/toilets> replacing energy-saving windows and doors> Installation of solar hot water panel.

Table 4-33: Demand for potential energy saving project

Sub-component	Very necessary	Necessary	Fair	Not that necessary	Un-necessary
External wall and rooftop insulation	46.8%	23.8%	11.4%	7.7%	10.3%
Replace water saving facets/toilets	44.8%	20.6%	15.1%	5.2%	14.2%
Replace Energy-saving windows and doors	37.9%	23.3%	18.9%	7.3%	12.6%
Installation of solar hot water panel	34.3%	16.0%	14.8%	11.4%	23.5%

(5) For community infrastructure

122. Local residents' attitude to the potential construction of community infrastructure is shown in the following table. At least half respondents think all the proposed sub-components are necessary and above. They prefer Installation of energy saving street/corridor lamps > Community greening> Upgrading stormwater/sewage pipes> Installation of underground power cable> Installation of gas pipes> Upgrading community exercise facilities> Installation of e-vehicle charging units for e-bicycles and etc.

Table 4-34: Attitude to the potential construction of community infrastructure

Sub-component	Very necessary	Necessary	Fair	Not that necessary	Un-necessary
Installation of energy saving street/corridor lamps	61.9%	24.9%	5.0%	1.4%	6.8%
Community greening	56.8%	24.6%	10.1%	2.8%	5.7%
Upgrading stormwater/sewage pipes	55.7%	23.0%	11.4%	2.7%	7.3%
Installation of underground power cable	54.3%	24.7%	11.0%	2.7%	7.3%

Installation of gas pipes	52.7%	22.4%	6.6%	3.0%	15.3%
Upgrading community exercise facilities	51.8%	26.3%	13.2%	2.8%	5.9%
Installation of e-vehicle charging units for e-bicycles	47.2%	24.7%	11.4%	4.1%	12.6%
Building ecological parking area	45.0%	27.2%	13.7%	4.3%	9.8%
Kitchen waste treatment station	43.6%	27.0%	13.2%	5.3%	10.9%
Domestic waste sorting area	43.4%	29.7%	12.6%	4.4%	9.8%
Intelligent waste sorting bins	42.3%	28.1%	13.9%	5.9%	9.8%
Installation of e-vehicle charging units for e-cars	40.2%	21.5%	14.9%	7.8%	15.5%
Provide more bins	34.3%	23.1%	16.4%	11.0%	15.1%

3. Residents' ability and willingness to pay

a. Residents' travel expenditure

(1) Bus fare

123. From May 1st, 2017, generally the buses with air conditioner in Xiangtan City start at a fare price of 2 Yuan/person • time, no matter about the seasons or day/night time. The ordinary buses without air conditioner keep the original fare at 1 Yuan/person • time and the night bus at 2 Yuan/person • time. However, if the distance is over 10km, the fare will increase to 3 or 4 Yuan/person • time. For example, the maximum fare for Route 9 and 101 is 4 Yuan/person • time while Route 102A and 102B 3 Yuan/person • time.

124. Passengers with the bus membership cards enjoy 30% discount of the normal fare, i.e. 1.4 Yuan/person • time. Students with student bus card enjoy 50% discount of the fare. The disabled with ‘Love heart’ bus card and the elderly over 65 years old with ‘Happiness’ bus card take the bus for free.

125. From July of 2019, passengers can use Alipay to pay for the bus fare. Even they have no bus membership card, they can have 10% discount of the normal fare.

(2) Parking rate

126. The interviewees said that the private car owners pay 5 Yuan per hour in the city center or business district. The rate for parking on the roads are various. Some are free, some not. Old residential zones often have no dedicated parking plots and thus free for parking. Residents in the new residential zones would like to buy or rent the dedicated parking plots. Some new residential zones charge the visiting cars. If the workplaces have their own parking plots, generally it is free to the employees.

127. The official document about parking rate issued in 2017 regulated complex rates by defining the levels of areas, see following tables.

Table 4-35: Temporary road parking rates (Unit: Yuan/half hour)

Area level	Within 1 hour	After 1 hour
Core area	2.5	3
First level area	2	2.5
Second level area	1.5	2

Note: Free for night (20:00-7:00)

Table 4-36 Maximum rates of urban public parking lots

Area level	Day time (7:00-22:00) (Yuan/0.5 hour)	Night time (22:00-7:00) (Yuan/0.5 hour)	One time per 12 hours (Yuan)	Maximum price of 24 hours (Yuan)
Core area	2.5	0.5	10	30
First level area	2	0.5	8	20
Second level area	1.5	0.5	8	15

Note: Free for staying less than 15 minutes

Table 4-37: Rate of parking lots of bus/coach/train stations or tourist attractions

Unit: Yuan/half hour

Item	Rate	Maximum price of 24 hours
bus/coach/train stations or tourist attractions	1.5	20

Note: Free for staying less than 15 minutes

b. Residents' ability to pay

128. In 2017, the average annual salary of employees in Xiangtan City is 62,933 yuan, and the average monthly salary is 5,244 yuan. For most local people who travel between 2 and 4 times daily for 22 working days of one month, the monthly bus fare only occupies 1.17~2.35% of the salary, which is affordable.

Table 4-38: Monthly bus fare and percentage of the salary

Item	2 times/day	4 times/day
Yuan/month	61.6	123.2
%	1.17	2.35

c. Residents' willingness to pay

(1) Bus fare

129. Most of the respondents (68.7%) are willing to pay 2 Yuan at most for air-conditioned bus, which is also the present fare. It seems local residents accept the present rate but don't want it to be increased even the service to be improved. 8.6% of the respondents are willing to pay 1 Yuan at most because they often use the ordinary bus without air conditioner or some think that 1 Yuan is enough for the fare for air conditioned bus was 1 Yuan in spring and autumn before the May of 2017. 18.7% of the respondents willing to pay 3 yuan, because they can afford a little rising fare. Only a few interviewees (3.2%) are willing to pay beyond 3 yuan.

Table 4-39: Willing to pay for improved bus service

39.1 If the bus service could be improved a lot, how much are you willing to pay at most? _____Yuan/time		
Option(yuan)	Frequency	Percent (%)
0	3	.7
1	35	8.6
2	279	68.7
3	76	18.7
4	8	2.0
5	5	1.2
Total	406	100.0

(2) Parking rate

130. Since many respondents need not to pay for parking whether in their communities or workplaces at present, they still want to maintain the status quo. About 2/3 respondents are unwilling to pay the parking fee at all in the communities (66.1%) and workplaces (67.0%). Comparing with the present parking rate of 5 Yuan/hour in the downtown area, 32.8% of respondents are willing to pay no more than 5 Yuan/hour in the communities and 31.8% in workplaces. Few respondents are willing to pay over 5 Yuan/hour.

131. In the downtown area, most respondents (60.9%) accept the present rate at 5 Yuan/hour and don't want it to be increased. Some (28.2%) even want it to be decreased. A few respondents (10.7%) are willing to pay more than 5 Yuan/hour, most of whom are willing to pay no more than 10 Yuan/hour.

Table 4-40: Willingness of parking rate in the community

Option(yuan)	Frequency	Percent (%)
0	123	66.1
1	11	5.9
2	11	5.9
3	10	5.4
4	2	1.1
5	27	14.5
8	1	.5
10	1	.5
Total	186	100.0

Table 4-41: Willingness of parking rate in the workplace

Option(yuan)	Frequency	Percent (%)
0	124	67.0
1	11	5.9
2	11	5.9

3	7	3.8
4	1	.5
5	29	15.7
8	1	.5
10	1	.5
Total	185	100.0

Table 4-42: Willingness of parking rate in the downtown area

Option(yuan)	Frequency	Percent (%)
0	2	1.1
1	7	3.8
2	16	8.7
3	26	14.1
4	1	.5
5	112	60.9
6	3	1.6
8	3	1.6
10	12	6.5
15	1	.5
20	1	.5
Total	184	100.0

(3) Community sub-component

132. Community sub-component designers estimate that local government will not ask local residents to share certain portion of the cost. During the survey, local residents were asked about their willingness to pay for some community sub-components closely related to individual households, i.e. external wall and rooftop insulation, replacing energy-saving windows and doors, installation of solar hot water panel, and replacing water saving facets.

133. The following tables show the difference of local residents' willingness to pay for various community sub-components. Obviously, more than 1/3 of the respondents who don't think the sub-component as fully unnecessary do not want to pay at all. About 40% respondents would like to pay less than 10% of the cost. The percentage of local residents who would like to pay higher portions more than 10% of the cost is getting less and less.

Table 4-43: Willingness to pay for community sub-components (1)

Option (%)	**External wall and rooftop insulation**		**Replacing Energy-saving windows and doors**	
	Frequency	**Percent (%)**	**Frequency**	**Percent (%)**
0	167	39.7	148	35.7
0.01-1	83	19.7	88	21.2
1.01-10	96	22.8	99	23.9
10.01-20	35	8.3	33	8.0

20.01-30	18	4.3	22	5.3
30.01-50	17	4.0	18	4.3
50.01-100	5	1.2	7	1.7

Table 4-44: Willingness to pay for community sub-components (2)

Option (%)	Installation of solar hot water panel		Replacing water saving facets	
	Frequency	Percent (%)	Frequency	Percent (%)
0	135	37.0	144	35.1
0.01-1	77	21.1	96	23.4
1.01-10	81	22.2	88	21.5
10.01-20	29	7.9	32	7.8
20.01-30	19	5.2	16	3.9
30.01-50	15	4.1	26	6.3
50.01-100	9	2.5	8	2.0

V. POVERTY ANALYSIS

A. Poverty status in the project area

1. Poverty situation

134. In2018 the urban minimum living security standard is 500yuan/month per capita in Xiangtan Municipality. Totally there are 15,893 urban households with 24,433urban residents enjoying the urban minimum living subsistence allowance. Among them, the female population is 11,248, accounting for 46.0%; the elderly is 2,178, accounting for 8.9%; and the disabled is 2,684, accounting for 11.0%.

135. In Yuhu District and Yuetang District, together there are 10,479 urban households with 16,171 urban residents enjoying the urban minimum living subsistence allowance. Among them, the female population is 7,223, accounting for 44.7%; the elder population is 1,161, accounting for 7.2%; and the disabled people population is 2,273, accounting for 5.2%. See the table below for details.

Table 5-1: Urban population enjoying MLS allowance in the project area (2018)

Region	Urban household enjoying MLS(household)	Urban residents enjoying MLS (persons)	Within it: women	Elderly	Disabled
Xiangtan Municipality	**15,893**	**24,433**	**11,248**	**2,178**	**2,684**
Yuhu District	6,573	10,158	4,506	768	1,588
Yuetang District	3,906	6,013	2,717	393	685

Source: From Xiangtan Municipal Civil Affairs Bureau

2. Poverty reduction in Xiangtan Municipality

136. In Xiangtan Municipality, the main work of aiding urban and rural HHs and residents enjoying MLS allowance is carried out by the Municipal Civil Affairs Bureau. During the Twelfth Five-Year period (2011-2015), Xiangtan Municipality actively had a useful exploration in the integration of aid resources, services procurement by government, and the introduction of professional social workers. At present, the Municipality has basically formed a multi-level, all-round, urban and rural integrated social assistance system, which takes urban and rural minimum living security as the main body, a variety of special assistance policy as the support, natural disaster emergency rescue, and especially poor people support as the supplementary. The urban MLS allowance increased from 240 yuan per person per month in 2010 to 400 yuan in 2014, to 460 yuan in 2016, then to 500 yuan in 2018. By the end of December 2018, the Municipality paid 130.12 million Yuan of urban MLS allowance, including a total of 83.42 million yuan paid in Yuhu District and Yuetang District. Since 2018, Xiangtan Municipality began to provide comprehensive insurance for poor households, including accidental injury/natural disaster insurance and supplementary for major illness insurance.

137. In addition, Xiangtan Municipality provides poor households who enjoy the minimum living subsistence allowance with a wide range of preferential policies, including (1) monthly fee waiver of 6 tons of water per household; (2) monthly fee waiver of 10 degrees of electricity per household; (3) monthly fee waiver of 6 cubic meters of natural gas per household (for natural gas users); (4) reduction of the 8 yuan for cable TV per household per month; (5) they can also enjoy education assistance, medical assistance, housing assistance, and related reductions in funeral expenses after death.

B. The role of the Project in poverty reduction

1. Positive impacts of the Project on poverty reduction

(1) Equally enjoy the improved transport service

138. Poor people in the project area will benefit equally from the Project. They will enjoy the faster, more convenient, safer and comforter bus services. They will enjoy the safer and more convenient pedestrian sideways, especially those poor disables or poor elderly. As the cyclists, they will also be equally protected and be safer.

(2) Less loss and be healthier

139. The improvement of urban climate resilience will decrease the flood risks. The poor will equally benefit from avoiding the property loss.

140. The improved environment because of using clean energy buses, the ecological engineering, and the green building of the hospital will be equally good for the health of the poor.

(3) Improved living environment

141. The community sub-component will directly improve the living environment of 20 local communities. Many of these communities are old neighbourhood reported as having old residential buildings and poor public infrastructure like broken roads, shortage of street lamps, drainage problem, no gas supply and etc. Especially, many residents living in these communities are the elderly (averagely 25.8% of the total population), the ex-workers or the retired of local bankrupt enterprises. The average percentage of residents enjoying the urban minimum living subsistence allowance is 2.0% in these communities, double that of Xiangtan City. The main

reasons for these urban poor are serious disease, disabled, labor force shortage, unemployment or low wage.

142. The community sub-components will benefit the poor people living in these 20 communities. The improved living environment caused by community greening, street/corridor lamps installation, underground cable arrangement, storm water/sewage pipes updating and etc. The sub-project will improve their life quality and good for their health. The setting of external wall and rooftop insulation, replacing energy-saving windows and doors, and water-saving facets/toilets will also help the poor families reduce their energy cost.

(4) New job opportunities

143. The construction and implementation period of the Project will create new job opportunities. It also give poor people the chance to find a new or better job and then get more income. The unskilled job opportunities will be given to the poor with priority.

2. Negative impact on poor households

144. Poor households in the project area will be equally affected by the project, especially during the construction period, such as, traffic congestion, bus routes change, travel inconvenience, and environment pollution by construction. The potential bus fare increase for the improved bus service might increase the economic burden on the poor households.

145. For the community sub-component, there is no statistically significant difference between the poor and the non-poor in their understanding of the positive impact and the negative impact. 8.8% of poor respondents thought the possible cost share as a negative impact while 8.0% of non-poor did, either no much difference.

C. Views of different income groups on the project-related issues

1. About the Project

146. There is statistically significant difference among various income groups in understanding the Project. Lower income group knew less about the Project.

Table 5-2: Respondents' Understanding of the Project

Income	Item	Know well	Know some	Don't know	Total
1,500 or less	Count	0	6	42	48
	%	0.0%	12.5%	87.5%	100.0%
1,501~3,000	Count	1	16	88	105
	%	1.0%	15.2%	83.8%	100.0%
3,001~6,000	Count	6	35	99	140
	%	4.3%	25.0%	70.7%	100.0%
Over 6,000	Count	1	19	50	70
	%	1.4%	27.1%	71.4%	100.0%

2. About the transportation

a. About traffic congestion

147. There is no statistically significant difference among various income groups in view about traffic congestion in Xiangtan City. But from the table below, it seems that lower income group thought the traffic congestion is more serious.

Table 5-3: Views about traffic congestion in Xiangtan City

Income	Item	Serious	Somewhat	No problem	Total
1,500 or less	Count	10	33	5	48
	%	20.8%	68.8%	10.4%	100.0%
1,501~3,000	Count	24	67	14	105
	%	22.9%	63.8%	13.3%	100.0%
3,001~6,000	Count	19	99	22	140
	%	13.6%	70.7%	15.7%	100.0%
Over 6,000	Count	7	47	16	70
	%	10.0%	67.1%	22.9%	100.0%

b. Current travel patterns

148. There is no statistically significant difference among various income groups in their average daily travel times. But from the table below, it seems that the income group no more than 5000 Yuan/month has less daily travel times.

Table 5-4: Average daily travel times

Income	Item	less than 2 times	2 to 4 times	more than 4 times	Total
1,500 or less	Count	15	28	5	48
	%	31.3%	58.3%	10.4%	100.0%
1,501~3,000	Count	26	73	6	105
	%	24.8%	69.5%	5.7%	100.0%
3,001~6,000	Count	30	98	12	140
	%	21.4%	70.0%	8.6%	100.0%
Over 6,000	Count	9	53	8	70
	%	12.9%	75.7%	11.4%	100.0%

149. There is statistically significant difference among various income groups in their major purposes of both trip 1 and trip 2. For trip 1, many people of various income groups go for work. But obviously the lower income group go to work less than and go for exercises/sightseeing/amusement more than the higher income group do. It is understand that the lower income group have less work and more free time. For trip 2, the lower income group go for shopping more than and escorting children to school less than the higher income group.

Table 5-5: Major purpose of trips

Trip 1 for									
Income	Item	home--workplace	going to school	escorting children to school	business	exercises/ sightseeing/ amusement	shopping/ catering	visiting friends, etc.	Total
1,500 or less	Count	23	1	8	4	10	2	0	48
	%	47.9%	2.1%	16.7%	8.3%	20.8%	4.2%	0.0%	100.0%
1,501~3,000	Count	78	2	3	1	16	6	0	106
	%	73.6%	1.9%	2.8%	0.9%	15.1%	5.7%	0.0%	100.0%
3,001~6,000	Count	110	2	6	2	15	2	0	137
	%	80.3%	1.5%	4.4%	1.5%	10.9%	1.5%	0.0%	100.0%
Over 6,000	Count	59	3	3	0	4	2	0	71
	%	83.1%	4.2%	4.2%	0.0%	5.6%	2.8%	0.0%	100.0%
Trip 2									
1,500 or less	Count	0	0	2	1	12	21	3	39
	%	0.0%	0.0%	5.1%	2.6%	30.8%	53.8%	7.7%	100.0%
1,501~3,000	Count	1	1	15	3	29	39	7	95
	%	1.1%	1.1%	15.8%	3.2%	30.5%	41.1%	7.4%	100.0%
3,001~6,000	Count	2	2	19	11	33	37	3	107
	%	1.9%	1.9%	17.8%	10.3%	30.8%	34.6%	2.8%	100.0%
Over 6,000	Count	1	1	21	4	15	11	0	53
	%	1.9%	1.9%	39.6%	7.5%	28.3%	20.8%	0.0%	100.0%

150. There is statistically significant difference among various income groups in the distance of trip 1, but not trip 2. For trip 1, obviously the lower income group prefer to work in the distance less than 5km, especially that below 3km.

Table 5-6: Distance of trip 1

Income	Item	Below 3km	3-5km	Over 5km	Total
1,500 or less	Count	20	9	2	31
	%	64.5%	29.0%	6.5%	100.0%
1,501~3,000	Count	63	15	16	94
	%	67.1%	16.0%	16.9%	100.0%
3,001~6,000	Count	58	22	30	110
	%	52.7%	20.0%	27.3%	100.0%
Over 6,000	Count	21	15	29	65
	%	32.3%	23.1%	44.6%	100.0%

151. There is no statistically significant difference among various income groups in their time spent on trip 1 and trip 2. Most people of various income groups spend less than 20min for work.

But it seems more people of the two middle income groups would spend over 20mins for work than those of the lowest and highest income group.

Table 5-7: Time spent for trip 1

Income	Item	Below 10mins	10-20mins	20-30mins	Over 30mins	Total
1,500 or less	Count	13	7	2	0	22
	%	59.1%	31.8%	9.1%	0.0%	100.0%
1,501~3,000	Count	38	18	17	8	81
	%	46.9%	22.2%	21.0%	9.8%	100.0%
3,001~6,000	Count	49	18	11	12	90
	%	54.4%	20.0%	12.2%	13.3%	100.0%
Over 6,000	Count	28	11	5	2	46
	%	60.9%	23.9%	10.9%	4.3%	100.0%

c. Residents' travel tools

(1) Travel tools of various income households

152. There are no much differences among various groups in owning bicycles and electric bicycles. However, the lower income group do own less traditional cars.

Table 5-8: Travel tools of various income groups

Income	Item	Bicycles	Electric bicycles	Tricycles	Electric tricycles	Motorcars	Traditional cars	New energy cars
1,500 or less	Count	11	24	1	1	7	14[2]	2
	%	22.9%	50.0%	2.1%	2.1%	14.6%	29.2%	4.2%
1,501~3,000	Count	31	63	1	4	19	46	1
	%	29.5%	60.0%	1.0%	3.8%	18.1%	43.8%	1.0%
3,001~6,000	Count	24	71	1	1	21	93	0
	%	17.1%	50.7%	0.7%	0.7%	15.0%	66.4%	0.0%
Over 6,000	Count	14	31	2	0	5	53	4
	%	20.0%	44.3%	2.9%	0.0%	7.1%	75.7%	5.7%

(2) Main travel means of the Respondents

153. There is statistically significant difference among various income groups in their travel means. The income group of no more than 1,500 Yuan/month use bicycle and bus more than other groups do. The income groups of less than 6,000 Yuan/month use more of electric bicycle and bus. The higher income groups use more of self-owned cars.

[2] It is estimated that the other family members may not be of low income although the interviewee's monthly income is less than 1,500 Yuan.

Table 5-9: Main travel means of the respondents

Income	Item	Walking	Bicycles	Public bicycles	Electric bicycles	Electric tricycle	Motorcycle
1,500 or less	Count	27	6	3	15	0	3
	%	30.0%	6.7%	3.3%	16.7%	0.0%	3.3%
1,501~3,000	Count	73	6	2	46	2	7
	%	36.0%	3.0%	1.0%	22.7%	1.0%	3.4%
3,001~6,000	Count	82	4	6	52	2	4
	%	31.1%	1.5%	2.3%	19.7%	0.8%	1.5%
Over 6,000	Count	42	3	4	19	2	0
	%	28.8%	2.1%	2.7%	13.0%	1.4%	0.0%

Income	Item	Self-owned car	Riding with friend, etc. in their car	Private car through Didi app	Traditional taxi	Bus	Total
1,500 or less	Count	11	0	1	1	23	90
	%	12.2%	0.0%	1.1%	1.1%	25.6%	100.0%
1,501~3,000	Count	23	0	0	2	42	203
	%	11.3%	0.0%	0.0%	1.0%	20.7%	100.0%
3,001~6,000	Count	54	0	8	2	50	264
	%	20.5%	0.0%	3.0%	0.8%	18.9%	100.0%
Over 6,000	Count	43	1	10	0	22	146
	%	29.5%	0.7%	6.8%	0.0%	15.1%	100.0%

154. There is no statistically significant difference among various income groups in their concerns when selecting travel means. But obviously the income group of over 6,000 Yuan/month concern less about cost.

Table 5-10: Residents' concerns when selecting travel means

Income	Item	Cost	Convenience	Speed	Comfort	Environmental protection	Low carbon	Safety	Total
1,500 or less	Count	13	39	8	12	0	2	5	79
	%	16.5%	49.4%	10.1%	15.2%	0.0%	2.5%	6.3%	100.0%
1,501~3,000	Count	22	95	22	9	6	2	16	172
	%	12.8%	55.2%	12.8%	5.2%	3.5%	1.2%	9.3%	100.0%
3,001~6,000	Count	31	120	38	20	5	3	12	229
	%	13.5%	52.4%	16.6%	8.7%	2.2%	1.3%	5.2%	100.0%
Over 6,000	Count	8	65	25	12	1	0	6	117
	%	6.8%	55.6%	21.4%	10.3%	0.9%	0.0%	5.1%	100.0%

(3) Views about transport

155. There is no statistically significant difference among various income groups in the main reasons for not taking the public bus, walking or riding bicycles, either the frequency of public

bicycle use. However, for the factors that may affect the car use, the cost of gasoline and parking statistically affect the various income groups differently, see table below. The lower income group concern more about the gasoline price increase than the higher income group. However, the income group of 3,001~6,000 Yuan/month concern most about the parking cost, which is the group often using the cars.

Table 5-11: Factors affecting the use of cars

Item	Income	Item	Important impact	Some impact	No impact	Total
Gasoline	1,500 or less	Count	10	9	3	22
		%	45.5%	40.9%	13.6%	100.0%
	1,501~3,000	Count	16	18	4	38
		%	42.1%	47.4%	10.5%	100.0%
	3,001~6,000	Count	36	38	16	90
		%	40.0%	42.2%	17.8%	100.0%
	Over 6,000	Count	8	27	21	56
		%	14.3%	48.2%	37.5%	100.0%
Parking cost	1,500 or less	Count	4	12	6	22
		%	18.2%	54.5%	27.3%	100.0%
	1,501~3,000	Count	5	26	7	38
		%	13.2%	68.4%	18.4%	100.0%
	3,001~6,000	Count	24	45	21	90
		%	26.7%	50.0%	23.3%	100.0%
	Over 6,000	Count	4	33	19	56
		%	7.1%	58.9%	33.9%	100.0%

156. Of the total 21 FGDs, three were focused on the poor households. There are various reasons for their poverty. Most are related to the serious/chronic illness and thus the unemployment and heavy economic burden, the disables (naturally borne or accident caused) in the families, or the oldest-old without children.

157. They reported that they often walk and ride bicycle for short distance, and bus for long distance. Sometimes they use public bicycle because it is free and kind of exercises. Some elderly poor said they don't know how to use the public bicycle but they have their own bicycles. Some misunderstood that there is no bus subsidy in Xiangtan for the poor families. But in fact they can enjoy the half bus fare. It is estimated that some poor people are not familiar with the preferential policies for them.

158. The interviewed poor people did not put forward any special requirement about public transport.

(4) Views about green travel

159. Many poor interviewees in the FGDs also heard of green travel before, which is closely related to the propaganda of the media and the community. In fact their present main travel means are green.

160. There is statistically significant difference among various income groups in supporting green travel. The lowest and highest income groups are the least to support green travel. Even, more people in the lowest income group think green travel as non-sense or don't know about it.

Table 5-12: willingness to green travel

Income	Item	Very supportive and will do my best	The idea is very good, but I do not often do it.	Non-sense	I don't know	Total
1,500 or less	Count	22	20	4	2	48
	%	45.8%	41.7%	8.3%	4.2%	100.0%
1,501~3,000	Count	75	26	3	1	105
	%	71.4%	24.8%	2.9%	1.0%	100.0%
3,001~6,000	Count	87	52	1	0	140
	%	62.1%	37.1%	0.7%	0.0%	100.0%
Over 6,000	Count	34	34	1	1	70
	%	48.6%	48.6%	1.4%	1.4%	100.0%

3. About green building

(1) Understanding of green building

161. There is no statistically significant difference among various income groups in understanding green building.

Table 5-13: Local residents' understanding of green building

Income	Item	Buildings with better greening	Buildings using high-tech technology	Energy-saving, and environmentally friendly ecological buildings	Non-toxic and environmentally friendly building	Total
1,500 or less	Count	23	10	36	27	96
	%	24.0%	10.4%	37.5%	28.1%	100.0%
1,501~3,000	Count	57	19	84	54	214
	%	26.6%	8.9%	39.3%	25.2%	100.0%
3,001~6,000	Count	76	32	108	68	284
	%	26.8%	11.3%	38.0%	23.9%	100.0%
Over 6,000	Count	38	23	57	39	157
	%	24.2%	14.6%	36.3%	24.8%	100.0%

(2) Civil green building

162. There is no statistically significant difference among various income groups in their concerns about green building.

Table 5-14: Concerns about civil green buildings

Income	Item	Indoor comfort.	Energy saving facilities	Environmental building materials used	Outdoor greening environment	Impact on global environment,	Others, please specify	Total
1,500 or less	Count	21	32	19	28	4	0	104
	%	20.2%	30.8%	18.3%	26.9%	3.8%	0.0%	100.0%
1,501~3,000	Count	66	66	51	49	16	0	248
	%	26.6%	26.6%	20.6%	19.8%	6.5%	0.0%	100.0%
3,001~6,000	Count	87	92	77	57	14	1	328
	%	26.5%	28.0%	23.5%	17.4%	4.3%	0.3%	100.0%
Over 6,000	Count	42	51	38	39	5	1	176
	%	23.9%	29.0%	21.6%	22.2%	2.8%	0.6%	100.0%

163. There is either no statistically significant difference among various income groups in their housing preference of green building. All the income groups prefer the green buildings when other conditions are similar.

Table 5-15: Preference of green building

Income	Item	Yes	No	Total
1,500 or less	Count	37	11	48
	%	77.1%	22.9%	100.0%
1,501~3,000	Count	83	22	105
	%	79.0%	21.0%	100.0%
3,001~6,000	Count	110	30	140
	%	78.6%	21.4%	100.0%
Over 6,000	Count	54	16	70
	%	77.1%	22.9%	100.0%

(3) Willingness to pay

164. There is no statistically significant difference among various income groups in the housing price increase of green building. Almost all the income groups could accept the housing increase of less than 3%. But from the table below, it seems that the income groups of over 3,000 Yuan/month can accept the housing increase between 3% and 5% more than other two lower income groups.

Table 5-16: Willingness to pay for commercial housing of green building

Income	Item	Less than 3%	3%~5%	5%~8%	8~10%	Total
1,500 or less	Count	40	4	2	2	48
	%	83.3%	8.3%	4.2%	4.2%	100.0%
1,501~3,000	Count	90	8	5	2	105
	%	85.7%	7.6%	4.8%	1.9%	100.0%
3,001~6,000	Count	100	28	9	3	140
	%	71.4%	20.0%	6.4%	2.1%	100.0%

Over 6,000	Count	49	16	2	3	70
	%	70.0%	22.9%	2.9%	4.3%	100.0%

4. About climate resilience/flooding

165. There is no statistically significant difference among various income groups in their understanding of the importance of reducing global warming. No group think it is unimportant. Most people in various groups think it is very important.

Table 5-17: Attitude to reduce global warming

Income	Item	Somewhat Important	Important	Very Important	Total
1,500 or less	Count	2	9	37	48
	%	4.2%	18.8%	77.1%	100.0%
1,501~3,000	Count	4	25	76	105
	%	3.8%	23.8%	72.4%	100.0%
3,001~6,000	Count	8	19	113	140
	%	5.7%	13.6%	80.7%	100.0%
Over 6,000	Count	2	9	59	70
	%	2.9%	12.9%	84.3%	100.0%

166. No poor interviewees in the FGDs reported that they are living in the flood-prone area or they had suffered from the flood. But some living in the suburb area said they knew that some vegetable fields near the river have been flooded before although not seriously. These people also reported that their villages had been updated in recent years, such as solar street lamp installed, road hardened, exercises facilities equipped, and square refurnished but without fountain. They were happy with the village improvement. They expected more greening, especially that along the road from the village to the bus stop which could shed them in the summer. They either cannot accept the idea of vertical greening on their housings for worrying about the snakes and insects.

5. About energy use

167. In the FGDs the poor interviewees knew the requirement of energy saving, which is closely related to the propaganda of the government, the communities and the media. In fact, even without the requirement, they have to be save the energy to reduce the expenditure. But the energy-saving methods or tips provided by the communities and the media taught them how to save the energy more efficiently and correctly. For example, the poor interviewees would like to put the remaining food in the fridge but they would not keep the food of green leaves for health because of its nitrite.

168. Poor interviewees thought the fridge and air conditioner are the two appliances consuming the electricity most in the housing. Some poor interviewees said they have the air conditioner but they only use it when necessary. For example, they use it in the summer when it is too hot. They seldom use it in the winter to save the cost. Most interviewed poor households have used energy-saving lamps. Most energy-saving lamps were given by the community carders. Some bought the energy-saving lamps by themselves.

169. Even with the preferential policies for the poor households, the poor interviewees thought

the electricity cost is much but the water cost is low and acceptable. In fact, the poor families also well implemented the ways of multiple water use.

170. There is no statistically significant difference among various income groups in their feeling of Xiangtan's winter, demand for central heating and acceptance of central cooling. But there is statistically significant difference among various income groups in the built time of their housing. If the insulation could be done for local residents, the poor housing should be the direct beneficiaries.

Table 5-18: Housing built time

Income	Item	1	2	3	4	5	6	Total
1,500 or less	Count	10	14	8	7	7	2	48
	%	20.8%	29.2%	16.7%	14.6%	14.6%	4.2%	100.0%
1,501~3,000	Count	21	29	18	16	16	5	105
	%	20.0%	27.6%	17.1%	15.2%	15.2%	4.8%	100.0%
3,001~6,000	Count	10	31	23	30	37	9	140
	%	7.1%	22.1%	16.4%	21.4%	26.4%	6.4%	100.0%
Over 6,000	Count	6	6	10	10	27	11	70
	%	8.6%	8.6%	14.3%	14.3%	38.6%	15.7%	100.0%

6. About community sub-project

171. There is statistically significant difference between the poor people and the non-poor people in their attitude to various community sub-components: external wall and rooftop insulation, installation of solar hot water panel, installation of energy saving street/corridor lamps, building ecological parking area, installation of e-vehicle charging units for e-cars, installation of e-vehicle charging units for e-bicycles, upgrading storm-water/sewage pipes, Installation of gas pipes, and Upgrading community exercise facilities. Although many poor people think these components are necessary, the degree is often lower that of the non-poor. It is estimated that they get used to the present condition and expect less than the non-poor.

172. According to the following table, the poor people prefer upgrading storm water/sewage pipes most, then the installation of gas pipes, then the installation of street/corridor lamps, then upgrading community exercise facilities, then the rest. It seems they prefer more about the improvement of basic public facilities.

Table 5-19: The poor's attitude to community sub-project (1)

Option		External wall and rooftop insulation		Installation of solar hot water panel		Installation of energy saving street/corridor lamps	
		Poor*	Not-poor	Poor	Not-poor	Poor	Not-poor
Very necessary	Count	24	239	19	174	31	317
	%	30.8%	49.4%	24.4%	36.0%	39.7%	65.5%
Necessary	Count	24	110	12	78	28	112
	%	30.8%	22.7%	15.4%	16.1%	35.9%	23.1%
Fair	Count	14	50	13	70	10	18
	%	17.9%	10.3%	16.7%	14.5%	12.8%	3.7%
Not that	Count	5	38	6	58	3	5

necessary	%	6.4%	7.9%	7.7%	12.0%	3.8%	1.0%
Un-necessary	Count	11	47	28	104	6	32
	%	14.1%	9.7%	35.9%	21.5%	7.7%	6.6%
Total	Count	78	484	78	484	78	484
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

* Poor: refer to the people who enjoy the urban minimum living allowance

Table 5-20: The poor's attitude to community sub-project (2)

Option		Building ecological parking area		Installation of e-vehicle charging units for e-cars		Installation of e-vehicle charging units for e-bicycles	
		Poor	Not-poor	Poor	Not-poor	Poor	Not-poor
Very necessary	Count	24	229	20	206	25	240
	%	30.8%	47.3%	25.6%	42.6%	32.1%	49.6%
Necessary	Count	21	132	18	103	23	116
	%	26.9%	27.3%	23.1%	21.3%	29.5%	24.0%
Fair	Count	17	60	14	70	12	52
	%	21.8%	12.4%	17.9%	14.5%	15.4%	10.7%
Not that necessary	Count	3	21	7	37	2	21
	%	3.8%	4.3%	9.0%	7.6%	2.6%	4.3%
Un-necessary	Count	13	42	19	68	16	55
	%	16.7%	8.7%	24.4%	14.0%	20.5%	11.4%
Total	Count	78	484	78	484	78	484
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 5-21: The poor's attitude to community sub-project (3)

Option		Upgrading storm water/sewage pipes		Installation of gas pipes		Upgrading community exercise facilities	
		Poor	Not-poor	Poor	Not-poor	Poor	Not-poor
Very necessary	Count	32	281	31	265	25	266
	%	41.0%	58.1%	39.7%	54.8%	32.1%	55.0%
Necessary	Count	21	108	26	100	24	124
	%	26.9%	22.3%	33.3%	20.7%	30.8%	25.6%
Fair	Count	16	48	8	29	18	56
	%	20.5%	9.9%	10.3%	6.0%	23.1%	11.6%
Not that necessary	Count	3	12	4	13	4	12
	%	3.8%	2.5%	5.1%	2.7%	5.1%	2.5%
Un-necessary	Count	6	35	9	77	7	26
	%	7.7%	7.2%	11.5%	15.9%	9.0%	5.4%
Total	Count	78	484	78	484	78	484
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

7. About participation

173. There is no statistically significant difference among various income groups in their involvement in various public activities. However, there is statistically significant difference among various income groups in the family member's participation, their understanding of effective participation measures, and willingness of activities to be involved.

174. The participation of the lower two income groups is more than that of the other two higher income groups. In fact, the participation of the income group of 3,000~6,000 Yuan/month is the lowest. It is estimated that they have to work very hard and have not time to participate in the public activities. Of the lowest income group, the participation of adult female is higher than that of the other groups, see the table below.

Table 5-22: Family members engaged in public activities

Income	Item	Adult Female	Adult Male	Elderly Female	Elderly Male	Children	No special person, it depended on who had time	Nobody	Total
1,500 or less	Count	3	0	0	0	7	9	13	32
	%	9.4%	0.0%	0.0%	0.0%	21.9%	28.1%	40.6%	100.0%
1,501 ~3,000	Count	3	1	0	0	16	18	27	65
	%	4.6%	1.5%	0.0%	0.0%	24.6%	27.7%	41.5%	100.0%
3,001 ~6,000	Count	2	0	1	1	13	12	42	71
	%	2.8%	0.0%	1.4%	1.4%	18.3%	16.9%	59.2%	100.0%
Over 6,000	Count	0	2	0	1	7	5	13	28
	%	0.0%	7.1%	0.0%	3.6%	25.0%	17.9%	46.4%	100.0%

175. The two lower income groups think the media publicizing less effective than the other two higher income groups do. But the two low income groups do prefer the post, see the table below.

Table 5-23: Effectiveness of various measures

Income	Item	Training	The media publicizing	Post	Booklet	Special promotional activities	Others	Total
1,500 or less	Count	2	30	7	3	3	3	48
	%	4.2%	62.5%	14.6%	6.3%	6.3%	6.3%	100.0%
1,501 ~3,000	Count	7	60	9	6	20	3	105
	%	6.7%	57.1%	8.6%	5.7%	19.0%	2.9%	100.0%
3,001 ~6,000	Count	14	99	3	2	16	6	140
	%	10.0%	70.7%	2.1%	1.4%	11.4%	4.3%	100.0%
Over 6,000	Count	2	56	1	3	8	0	70
	%	2.9%	80.0%	1.4%	4.3%	11.4%	0.0%	100.0%

176. To attend the low carbon related activities, the lower income group prefers more through watching TV and attending the activities organized by the communities while the higher income group through the activities organized by their units. It is understood that many people of the low income group are self-employed or have part-time/no jobs.

Table 5-24: Activities to be involved in

Income	Item	Receive training	Receive the booklet	Watch TV publicizing	Read the post	Your community -organized activities	Your unit-organized activities	Others	Total
1,500	Count	1	3	28	1	12	1	2	48
or less	%	2.1%	6.3%	58.3%	2.1%	25.0%	2.1%	4.2%	100.0%
1,501	Count	6	4	55	3	22	14	1	105
~3,000	%	5.7%	3.8%	52.4%	2.9%	21.0%	13.3%	1.0%	100.0%
3,001	Count	5	10	69	1	26	28	1	140
~6,000	%	3.6%	7.1%	49.3%	0.7%	18.6%	20.0%	0.7%	100.0%
Over	Count	2	4	32	2	7	22	1	70
6,000	%	2.9%	5.7%	45.7%	2.9%	10.0%	31.4%	1.4%	100.0%

D. Demands for the Project

1. Attitude to other sub-projects

177. There is no statistically significant difference among various income groups in their views on the importance of the sub-projects like central heating, green travel and green building. But there is the statistically significant difference in central cooling, see table below. The lower income group thinks less importance of central cooling than the higher income group.

Table 5-25: Residents' attitude to central cooling

Income	Item	Not necessary	Somewhat necessary	necessary	Very necessary	Total
1,500 or less	Count	23	10	13	2	48
	%	47.9%	20.8%	27.1%	4.2%	100.0%
1,501~3,000	Count	37	27	20	21	105
	%	35.2%	25.7%	19.0%	20.0%	100.0%
3,001~6,000	Count	50	41	37	12	140
	%	35.7%	29.3%	26.4%	8.6%	100.0%
Over 6,000	Count	17	15	25	13	70
	%	24.3%	21.4%	35.7%	18.6%	100.0%

2. Poor household's ability and willingness to pay

(1) Bus fare

178. Since few poor households have cars, here we only consider the poor people's ability to pay the bus fare and their willingness to accept the potential increase of bus fare.

179. The monthly income of poor people is 500 Yuan/person and they can enjoy the half bus fare. Assuming that one poor person works 22 days/month, if he takes 2 trips per day, the bus fare occupies 6.2% of his income. If he takes 4 trips per day, the bus fare is double. Considering that 25.6% of low income group often go for work by bus, the economic burden of bus fare on the poor group might be lighter.

Table 5-26: Monthly bus fare and percentage of the salary

Item	2 times/day	4 times/day
Yuan/month	30.8	61.6
%	6.2	12.3

180. There is no statistically significant difference among various income groups in their willingness to pay for improved bus services. Most people of various income groups prefer to keep the present bus fare at 2 Yuan/time. Some low-income people expect a lower price or keep the ordinary bus fare at 1 Yuan/time.

Table 5-27: Willingness to pay for improved bus service

Income	Item	0	1	2	3	4	5	Total
1,500 or less	Count	0	8	32	7	0	1	48
	%	0.0%	16.7%	66.7%	14.6%	0.0%	2.1%	100.0%
1,501~3,000	Count	2	8	74	20	0	1	105
	%	1.9%	7.6%	70.5%	19.0%	0.0%	1.0%	100.0%
3,001~6,000	Count	0	9	105	21	4	1	140
	%	0.0%	6.4%	75.0%	15.0%	2.9%	0.7%	100.0%
Over 6,000	Count	1	4	42	17	4	2	70
	%	1.4%	5.7%	60.0%	24.3%	5.7%	2.9%	100.0%

(2) Community sub-component

181. There is statistically significant difference between the poor people and the non-poor people in their willingness to pay all he four community sub-components closely related to individual households, i.e. external wall and rooftop insulation, replacing energy-saving windows and doors, installation of solar hot water panel, and replacing water saving facets. However, the following table show a result different from the general anticipation that the poor would be more reluctant to share some cost than the non-poor. The percentages of the non-poor who would not pay at all are all much higher than those of the poor. The percentages of the poor who would like to pay 1.01~10% of the cost are much higher than those of the non-poor. It is estimated that the poor respondents were specially informed by the community managers to answer the online questionnaire since a certain percentage of the poor respondents was requested before the survey. This might make the poor feel that they need to support the project and thus increase their willingness to pay.

Table 5-28: Willingness to pay for community sub-components

Option		External wall and rooftop insulation		Replace Energy-saving windows and doors		Installation of solar hot water panel		Replace water saving facets/toilets	
		Poor	Non-poor	Poor	Non-poor	Poor	Non-poor	Poor	Non-poor
0	Count	14	153	14	134	10	125	11	133
	%	26.9%	41.5%	25.5%	37.2%	20.8%	39.4%	21.6%	37.0%
0.01-1%	Count	10	73	11	77	10	67	13	83
	%	19.2%	19.8%	20.0%	21.4%	20.8%	21.1%	25.5%	23.1%
1.01-10%	Count	20	76	21	78	16	65	16	72
	%	38.5%	20.6%	38.2%	21.6%	33.3%	20.5%	31.4%	20.0%

10.01-20%	Count	3	32	3	30	6	23	6	26
	%	5.8%	8.7%	5.5%	8.3%	12.5%	7.3%	11.8%	7.2%
20.01-30%	Count	2	16	3	19	3	16	3	13
	%	3.8%	4.3%	5.5%	5.3%	6.3%	5.0%	5.9%	3.6%
30.01-50%	Count	1	16	1	17	0	15	1	25
	%	1.9%	4.3%	1.8%	4.7%	0.0%	4.7%	2.0%	7.0%
50.01-100%	Count	2	3	2	5	3	6	1	7
	%	3.8%	0.8%	3.6%	1.4%	6.3%	1.9%	2.0%	1.9%
Total	Count	52	369	55	360	48	317	51	359
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

VI. GENDER ANALYSIS

A. Situation of local women

1. Women in Xiangtan Municipality

182. By the end of 2018, the total population of Xiangtan Municipality is 2.865 million, of which women are1.397million, accounting for 48.8%.

183. Participation in politics: In 2017, 71.9% leader groups of various departments in Xiangtan municipal committee and government have women. The rate of female cadres in the leadership of county-level government work departments is 62.8%; the proportion of female cadres in the leading bodies of municipal government work departments is 10.4%, and 23.6% female cadres in the leadership of county-level government work departments. The proportion of women in the neighborhood committee is 75.7% and in village committee is 39.0%. Female representatives in the county (district) people's congress account for33.3%. Female representatives in the Municipality people's political consultative conference respectively account for 26.3%.

184. Economic participation: In 2017, there are 1,720.1 thousand total employment in Xiangtan City, of which, 829.1thousand are women, accounting for 48.2%. 393.7 thousand people employed in urban units, of which, 190.6 thousand are women, accounting for 48.5%. The proportion of female senior professional technicians is 5.0%.

185. Education equality: The high school enrollment rate of women in 2017 is 96%. The gross enrollment rate in junior high school and the net enrollment rate of primary school girls are both 100%. Social security: In 2017, 1208 thousand people in Xiangtan enjoy basic endowment insurance for urban residents, of which women are 613 thousand, accounting for 40.7%. 0.47 million people enjoy basic medical insurance for urban workers, of which women are 0.22 million, accounting for 47.3%. 2.37million people enjoy urban resident medical insurance, of which, women are 1.16 million, accounting for 49.1%. The minimum living allowance for urban residents was 43,800, of which 18,900 were women, accounting for 43.2%.

2. Women in the project area

186. The socio-economic survey involved a total of 406 respondents. The total HH population is 1,165, including 579 women, accounting for 49.7%. In terms of age distribution, the

percentage of women younger than 40 years old is higher than that of men, while the percentage of the men older than 40 years old is a bit higher than that of the women. But overall, the gender distribution of all ages are relatively even. See the table below.

Table 6-1: Age Distribution by Gender

Gender		AGE								Total
		0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	
man	Number	78	52	99	108	120	81	31	15	584
	%	13.4%	8.9%	17.0%	18.5%	20.5%	13.9%	5.3%	2.6%	100.0%
women	Number	64	66	96	124	119	61	28	16	574
	%	11.1%	11.5%	16.7%	21.6%	20.7%	10.6%	4.9%	2.8%	100.0%

187. The Education Level of the Interviewed family members is relatively high, generally at the junior high school level or above, which is related to the characteristic of urban residents. There is no statistically significant difference between the male and female. See the table below.

Table 6-2: Education Distribution by Gender

Gender		Education							Total
		No schooling	Primary school	Secondary School	High school	College	University	Postgraduate or above	
man	Number	2	19	95	125	103	109	18	471
	%	0.4%	4.0%	20.2%	26.5%	21.9%	23.1%	3.8%	100.0%
women	Number	2	27	93	131	105	109	15	482
	%	0.4%	5.6%	19.3%	27.2%	21.8%	22.6%	3.1%	100.0%

188. In the interviewed families, many male and female members are private employees and Self-employed persons. Generally, the proportions of women in all types of occupation are lower than that of men, while housewives account for about 107.5% of all women. See the table below.

Table 6-3: Occupational Distribution by Gender

Gender		Occupation											Total
		Government staff	State-owned enterprise Staff	Private enterprise Staff	Self-employed	Farmer	Military	Housewife	Unemployed	Student	Retiree	Others	
Man	Number	55	34	113	142	16	1	3	15	89	52	13	533
	%	10.3	6.3	21.2	26.6	3.0	0.2	0.6	2.8	16.7	9.8	2.4	100.0
Women	Number	57	23	100	127	16	0	40	8	90	61	9	531
	%	10.7	4.3	18.8	23.9	3.0	0.0	7.5	1.5	16.9	11.5	1.7	100.0

189. In terms of income distribution, the percentage of women whose monthly income is less than 3,000 yuan is higher than that of men, while the percentage of men whose monthly income is more than 3,000 yuan is higher than that of women. See the table below.

Table 6-4: Monthly income distribution by Gender

Gender		Monthly income (Yuan)							Total
		1,500 or less	1,501~3,000	3,001~6,000	6,001~10,000	10,001~15,000	15,001~20,000	20,000 or more	
Man	Number	51	102	178	75	20	4	4	434
	%	11.8%	23.5%	41.0%	17.3%	4.6%	0.9%	0.9%	100.0%
Women	Number	81	130	161	39	11	7	2	431
	%	18.8%	30.2%	37.4%	9.0%	2.6%	1.6%	0.5%	100.0%

B. Project Impacts on Women

1. Positive impacts on women

(1) Providing local women with better bus services

190. After the completion of the Project, women will benefit equally from the Project as well as men. But because women have a higher proportion of taking bus than men, in fact women can benefit more from the Project. The project will save the travel time of women who commute during peak time and/or escort their children. It will also bring convenience to women who often go shopping for their families.

(2) Providing local women with safer travel and more inclusive access

191. The inclusiveness target of the Project will especially benefit the women who often escorting their children and looking after the elderly or disabled families. It will reduce women' worry about travel safety of themselves and their children.

192. Since women also have a higher proportion of walking than men, in fact women can benefit more from the Project. More walking and bicycle riding encouraged by the Project will help women keep fit.

(3) Avoiding economic loss of flooding and enjoying new hospital

193. Women in the project area will equally avoid economic loss of flooding and enjoy new hospital as green building.

(4) Providing local women with better living condition

194. The community sub-project will equally provide local women with an improved living environment. Especially the installation of street/corridor lamps will increase women' safety in the evening. The repair of broken roads will reduce their worry about playing children's safety. The saving of the domestic energy cost may increase their sense of happiness.

(5) Providing local women with employment opportunities

195. The construction and operation of the Project will bring new employment opportunities to local women. Especially in the operation period, the Project has more opportunities to hire female employees, e.g. the positions in the new hospital, the parking fee collectors.

2. Negative impacts on women

196. Women will also suffer from the potential negative impact during the construction period, such as, traffic congestion, bus routes change, travel inconvenience, and environment pollution by construction. Specially, women may concern more about the increase of bus fare or parking fee.

197. For the community sub-component, there is no statistically significant difference between women and men in their understanding of the positive impact and the negative impact.

C. Women' views about project-related issues

1. About the Project

198. There is no statistically significant difference between men and women in understanding the Project. However, women who don't know the Project at all are much more than men.

Table 6-5: Women' understanding of the Project

Gender	Item	Know well	Know some	Don't know	Total
Man	Count	5	50	141	196
	%	2.6%	25.5%	71.9%	100.0%
Women	Count	3	37	170	210
	%	1.4%	17.6%	81.0%	100.0%

2. About transportation

a. About traffic congestion

199. There is statistically significant difference between men and Women' views about traffic congestion in Xiangtan City. Relatively, women think the traffic congestion is more serious than men.

Table 6-6: Women' views about traffic congestion

Gender	Item	Serious	Somewhat	No problem	Total
Man	Count	22	142	32	196
	%	11.2%	72.4%	16.3%	100.0%
Women	Count	42	131	37	210
	%	20.0%	62.4%	17.6%	100.0%

b. Women' current travel patterns

200. There is no statistically significant difference between men and women in their daily travel times. Most women (70.5%) travel 2 to 4 times per day, similar to men.

201. But there is statistically significant difference of the main trip purposes. For the first trip, most women go for work as men. However, the proportions of women who go for exercise/sightseeing/amusement, escort children to school and shopping/dining are all higher

than those of men. While the proportion of men who travel for business is higher than that of women. For the second trip, the proportions of men who travel for exercises/ sightseeing/ amusement and business are significantly higher than that of women, while inversely for shopping/catering.

Table 6-7: Women' daily travel times

Gender	Item	less than 2 times	2 to 4 times	more than 4 times	Total
Men	Count	45	132	18	195
	%	23.1%	67.7%	9.2%	100.0%
Women	Count	45	148	17	210
	%	21.4%	70.5%	8.1%	100.0%

Table 6-8: Women' main purposes for trips

Trip	Gender	Item	for home—workplace	for going to school	for escorting children to school	for business	for exercises/ sightseeing /amusement	for shopping/ catering	for visiting friends/ relatives	Total
1st trip	Men	Count	147	10	6	6	21	2	0	192
		%	76.6%	5.2%	3.1%	3.1%	10.9%	1.0%	0.0%	100.0%
	Women	Count	136	17	14	1	30	11	0	209
		%	65.1%	8.1%	6.7%	0.5%	14.4%	5.3%	0.0%	100.0%
2nd trip	Men	Count	0	3	24	15	56	42	8	148
		%	0.0%	2.0%	16.2%	10.1%	37.8%	28.4%	5.4%	100.0%
	Women	Count	4	2	34	4	44	86	6	180
		%	2.2%	1.1%	18.9%	2.2%	24.4%	47.8%	3.3%	100.0%

202. There is no statistically significant difference between men and women in the distance and duration of their first trip. Most women travel for work less than 15km and cost less than 30 mins. But we still can see from the table that the proportion of women who travel less than 3km for work is higher than that of men.

203. There is statistically significant difference of the 2nd trip. Most women travel for shopping/exercises less than 5km and cost less than 20 mins. The proportion of women who travel between 1 and 5km for shopping/exercises is similar to that of men. But more women prefer to travel less than 1km while more men prefer to travel over 5km.

Table 6-9: Women' Trip distance

Trip	Gender	Item	Below 1km	1-3km	3-5km	5-15km	15-25km	over 25km	Total
1st trip	Men	Count	27	50	33	37	3	4	154
		%	17.5%	32.5%	21.4%	24.0%	1.9%	2.6%	100.0%
	Women	Count	42	67	36	34	6	0	185
		%	22.7%	36.2%	19.5%	18.4%	3.2%	0.0%	100.0%
2nd trip	Men	Count	22	41	26	25	3	0	117
		%	18.8%	35.0%	22.2%	21.4%	2.6%	0.0%	100.0%

	Women	Count	47	53	35	16	2	2	155
		%	30.3%	34.2%	22.6%	10.3%	1.3%	1.3%	100.0%

Table 6-10: Women' Trip duration

Trip	Gender	Item	Below 5mins	5-10mins	10-20mins	20-30mins	30-40mins	Over 40mins	Total
1st trip	Men	Count	23	39	63	17	8	4	154
		%	14.9%	25.3%	40.9%	11.0%	5.2%	2.6%	100.0%
	Women	Count	19	59	68	27	4	7	184
		%	10.3%	32.1%	37.0%	14.7%	2.2%	3.8%	100.0%
2nd trip	Men	Count	22	33	19	24	9	11	118
		%	18.6%	28.0%	16.1%	20.3%	7.6%	9.3%	100.0%
	Women	Count	27	54	44	18	5	7	155
		%	17.4%	34.8%	28.4%	11.6%	3.2%	4.5%	100.0%

c. Women' travel tools

(1) Main travel means

204. The main travel means of women are walking (34.4%), bus (21.8%), self-owned car (14.9%) and electric bicycles (17.3%). There is no statistically significant difference between men and women in their main travel means. However, from Table 6-11, we still can see that the proportion of men who travel mainly by self-owned car is higher than that of women, while inversely by walking and bus. In fact, of 232 households who have the cars, 190 men (81.9%) were answered as the main car driver. The proportion of men and women who travel by electric bicycles is similar. It is estimated that riding electric bicycle is easy for both men and women.

Table 6-11: Women' main travel means

Gender	Item	Walking	Bicycles	Public bicycles	Electric bicycles	Electric tricycle	Motorcar
Men	Count	111	13	8	65	4	6
	%	30.6%	3.6%	2.2%	17.9%	1.1%	1.7%
Women	Count	145	8	11	73	3	9
	%	34.4%	1.9%	2.6%	17.3%	0.7%	2.1%

Gender	Item	Self-owned car	Riding with friends etc. in their car	Private car through Didi app	Traditional taxi	Bus	Total
Men	Count	77	1	14	3	61	363
	%	21.2%	0.3%	3.9%	0.8%	16.8%	100.0%
Women	Count	63	0	16	2	92	422
	%	14.9%	0.0%	3.8%	0.5%	21.8%	100.0%

205. There is no statistically significant difference between men and women in selecting travel means. Women also concern most about convenience. But it seems women concern more about cost while men concern more about speed, see Table 6-12.

Table 6-12: Women' concerns when selecting travel means

Gender	Item	Cost	Convenience	Speed	Comfort
Men	Count	34	169	54	31
	%	10.7%	53.0%	16.9%	9.7%
Women	Count	50	186	48	31
	%	14.3%	53.3%	13.8%	8.9%
Gender	Item	Environmental protection	Low carbon	Safety	Total
Men	Count	9	2	20	319
	%	2.8%	0.6%	6.3%	100.0%
Women	Count	4	5	25	349
	%	1.1%	1.4%	7.2%	100.0%

(2) About walking

206. Male and female pedestrians have similar views about transport in many aspects. Here only those different from men are listed as below.

207. Women specially worry about children's safety. Some, especially the elderly women, said they really felt unsafe for often being stuck in the middle of the zebra lines since the green light time is short and they walk relatively slowly when carrying or escorting the children. Some also complained about the electric bicycles parking on the zebra lines in front of the traffic lights, which slowed their walking speed when crossing the road. Some said the cars drivers often do not politely let them cross the road first even seeing them escorting the children and walking on the zebra lines. Some women worried about their teenagers who go to the school alone.

208. Some women who often use prams or look after the elderly with wheelchairs complained about the inconvenient accessibility of some pedestrian sidewalks, like with stairs, without curb ramp, and steep or narrow curb ramp.

209. Some women referred to the quality of car drivers or electric bicycle riders. They especially don't like those who often honk or beep after them when they are walking on the road. Some women expected the low quality car drivers or motorcar/electric bicycle riders to be educated or fined in order to change their bad behaviour.

(3) About bus

210. Of the 208 female respondents, 43.8% has bus card, higher than the proportion of men. It also means women prefer to take bus more than men, see Table 6-13.

Table 6-13: Women' ownership of bus card

Gender	Item	Bus card	Total
Men	Count	66	192
	%	34.4%	100.0%
Women	Count	91	208
	%	43.8%	100.0%

211. There is no statistically significant difference between men and women in the reasons for not often taking bus. The main reasons for not often taking the public bus are: taking self-owned electric bicycle, motorcycle, private car, or shuttle bus are more convenient than taking bus (25.4%), no need to take the bus because of short distance (23.7%), far from bus station (20.2%), long time wait for bus (14.5%) and slow bus speed (5.2%).

212. In the FGDs, female interviewees referred to the bus stop with sun/rain shed more than male. Some women who often use prams said it is difficult for them to take the prams with children alone because almost all buses have steps. They expected the at-level boarding of the new buses.

Table 6-14: Women' main reasons for not often taking the public bus

Gender	Item	far from bus station	too crowded in the bus	waiting too long for a bus	Poor service of bus staff	Slow bus speed	Need to transfer Many times
Men	Count	32	8	20	3	16	8
	%	16.6%	4.1%	10.4%	1.6%	8.3%	4.1%
Women	Count	35	8	25	2	9	2
	%	20.2%	4.6%	14.5%	1.2%	5.2%	1.2%
Gender	Item	Short distance and no need to take a bus	Unsafe to ride the bus	Don't know how to ride the bus, e.g. routes	Take self-owned electric bicycle, motorcycle, private car, or shuttle bus, more convenient than bus	Other, please specify	Total
Men	Count	42	0	5	53	6	193
	%	21.8%	0.0%	2.6%	27.5%	3.1%	100.0%
Women	Count	41	1	2	44	4	173
	%	23.7%	0.6%	1.2%	25.4%	2.3%	100.0%

213. No female interviewees reported that they met the sex harassment in the bus. The interviewed female undergraduates explained that they often to the downtown by taking the bus route mostly serving for students. They often go out in group and generally they not go back to the university or colleges too late in the evening.

214. The staff both in the Women Federation expressed that they did not receive any complain about sex harassment in the bus. They estimated that Xiangtan is only a middle size city and local people are relatively simple. Most of the external population are students coming for universities or colleges. They thought sex harassment in the bus is not a big issue in Xiangtan. But they also admitted that maybe there were a few cases but the victim did not report for various reasons.

(4) About electric bicycle riders and cyclists

215. There is no much proportion difference between women and men who ride electric bicycles and bikes. There is either no statistically significant difference between men and women in riding the public bicycle. 41.0% of women never used public bicycle, 37.1% sometimes use it and 21.9% frequently use it (see Table 6-15).

Table 6-15: Women' public bicycle use

Gender	Item	Frequently	Sometime	Never used	Total
Men	Count	30	80	86	196
	%	15.3%	40.8%	43.9%	100.0%
Women	Count	46	78	86	210
	%	21.9%	37.1%	41.0%	100.0%

216. There is no statistically significant difference between men and women in the reasons for not often walking or taking bicycles. The main reasons for women are: too long distance (33.9%), unsuitable weather (25.7%), too tired (20.2%), too much time (11.9%), and unsafe road (3.7%). Women in the FGDs said they prefer to take bus when the weather is not good enough, especially when escorting the children. Within the raincoats, it is inconvenient to ride the bikes or electric bicycles in raining days. Even with sun/rain shed installed, it is somewhat unsafe to ride the electric bicycles in the windy days.

Table 6-16: Women' main reasons for not often walk or riding bicycles

Gender	Item	Too long distance	Cost too much time	Too tired	Unsuitable weather	Unsafe road
Men	Count	39	15	28	19	6
	%	33.1%	12.7%	23.7%	16.1%	5.1%
Women	Count	37	13	22	28	4
	%	33.9%	11.9%	20.2%	25.7%	3.7%
Gender	Item	Poor road or traffic facilities	Inconvenient to charge electric bicycles	Few friends,etc. walk or ride their bike	Other, please specify	Total
Men	Count	3	2	1	5	118
	%	2.5%	1.7%	0.8%	4.2%	100.0%
Women	Count	1	1	1	2	109
	%	0.9%	0.9%	0.9%	1.8%	100.0%

217. In the FGDs, some women said it would be better for the public bicycles to be installed with the back seats and thus they can carry their children. Some women said the battery of the electric bicycle is too heavy to carry it upstairs for recharging. They strongly welcomed the electric bicycle recharging stations to be installed in their communities.

(5) About cars

218. There is no statistically significant difference between men and women in answering the importance of factors that will affect their use of cars. The survey result shows the factors that affect women' car use are: gasoline price (31.9%) > parking vacancies (28.6%) > traffic congestion (23.5%), parking costs in congested areas (19.3%) > parking costs in other areas (17.6%).

Table 6-17: Factors affecting women' use of cars

Item	Gender	Important impact	Some impact	No impact
Gasoline price	Men	35.1%	41.4%	23.4%
	Women	31.9%	48.7%	19.3%
Parking costs	Men	18.9%	55.0%	26.1%
	Women	17.6%	58.8%	23.5%
Parking costs in congested areas	Men	27.0%	53.2%	19.8%
	Women	19.3%	64.7%	16.0%
Parking vacancies	Men	35.1%	55.0%	9.9%
	Women	28.6%	63.9%	7.6%
Degree of congestion	Men	31.5%	55.0%	13.5%
	Women	23.5%	68.9%	7.6%

(6) About green travel

219. There is no statistically significant difference between men and women in supporting green travel. However, from the table below we can see that the proportion of women who support the green travel is much more than that of men.

Table 6-18: Women' willingness to green travel

Gender	Item	Very supportive and will do my best	The idea is very good, but I do not often do it.	Non-sense	I don't know	Total
Men	Count	111	78	6	1	196
	%	56.6%	39.8%	3.1%	0.5%	100.0%
Women	Count	140	62	5	3	210
	%	66.7%	29.5%	2.4%	1.4%	100.0%

220. When distance allows, women prefer the green travel way of walking(67.7%) first, then bus (13.6%) and bicycle (8.6%) next.

Table 6-19: Women preferred ways of green travel

Gender	Item	walking	Bicycle	Electric vehicle	Bus	Choose smaller car	Car pool	Total
Men	Count	107	21	17	19	10	6	180
	%	59.4%	11.7%	9.4%	10.6%	5.6%	3.3%	100.0%
Women	Count	134	17	9	27	6	5	198
	%	67.7%	8.6%	4.5%	13.6%	3.0%	2.5%	100.0%

221. The reasons for selecting the green travel ways are: convenient and fast (27.6%), as exercises (26.6%), not tired (23.8%), and affordable (16.2%) (see Table 6-20).

Table 6-20: Women' reasons for selecting green travel ways

Gender	more affordable	easier, not too tired	Doing exercises while travelling	more convenient and fast	more comfortable	safer	No damage to the environment	least time	Total
	31	64	73	77	6	1	6	0	258
Men	12.0%	24.8%	28.3%	29.8%	2.3%	0.4%	2.3%	0.0%	100.0%
	47	69	77	80	4	5	7	1	290
Women	16.2%	23.8%	26.6%	27.6%	1.4%	1.7%	2.4%	0.3%	100.0%

3. About green building

(1) Understanding of green building

222. There is no statistically significant difference between men and women in understanding green building. Most women (80.0%) know that green building are energy-saving, water-saving, energy-saving, environmentally protective and ecological. Half women think that green building should have better greening, non-toxic and environmentally friendly. A few respondents (21.0%) think high technology could be used in green building.

Table 6-21: Women' understanding of green building

Gender	Item	Buildings with better greening in the community	Buildings using high-tech technology	Energy-saving, water-saving, energy-saving and environmentally friendly ecological buildings	Non-toxic and environmentally friendly building
	Count	103	45	150	99
Men	%	52.6%	23.0%	76.5%	50.5%
	Count	104	44	168	105
Women	%	49.5%	21.0%	80.0%	50.0%

(2) Civil green building

223. Women' concerns about the characteristics of civil green building are: energy saving facilities (26.6%), indoor comfort (25.0%), safe building materials (23.0%), and outdoor greening environment (20.2%). Only a few (5.2%) concern about the impact on global environment. But in the FGDs, female interviewees talked more about global warming and climate change. They referred to the haze and concerned about children' health.

Table 6-22: Women' concerns about civil green buildings

Gender	Item	Indoor comfort, such as air quality and ventilation, thermal comfort, lighting, noise, etc.	Power saving, water saving, and heating saving facilities	Environmental protection and health and safety of building materials used	Outdoor greening environment	Impact on global environment, such as CO2 emissions, waste recycling, etc	Others	Total
Men	Count	116	135	92	85	17	2	447
	%	26.0%	30.2%	20.6%	19.0%	3.8%	0.4%	100.0%
Women	Count	125	133	115	101	26	0	500
	%	25.0%	26.6%	23.0%	20.2%	5.2%	0.0%	100.0%

224. 81.4% of women prefer the commercial housing of green building. The proportion is higher than that of the men.

Table 6-23: Women' preference of green building

Gender	Item	Yes	No	Total
Men	Count	149	47	196
	%	76.0%	24.0%	100.0%
Women	Count	171	39	210
	%	81.4%	18.6%	100.0%

(3) Willingness to pay

225. Most women (77.6%) accept the price increase of less than 3% for green building. 14.8% of women can accept the increase between 3~5% while a few can accept the increase over 5%. There is no statistically significant difference between men and women' answers.

Table 6-24: Women' willingness to pay for commercial housing of green building

Gender	Item	Less than 3%	3%~5%	5%~8%	8~10%	Total
Men	Count	138	42	10	6	196
	%	70.4%	21.4%	5.1%	3.1%	100.0%
Women	Count	163	31	11	5	210
	%	77.6%	14.8%	5.2%	2.4%	100.0%

4. About urban resilience/flooding

226. Most women think that reducing global warming is very important while nobody think it is unimportant. The below table shows that women concern global warming more than men.

227. But when talking about their views to the potential flood risks and urban climate resilience, there was no special ideas from female interviewees. They also trust government in taking measures. Some women did prefer for more greening in the communities for better shade in the summer.

Table 6-25: Attitude to reduce global warming

Gender	Item	Somewhat Important	Important	Very Important	Total
Men	Count	12	30	154	196
	%	6.1%	15.3%	78.6%	100.0%
Women	Count	4	35	171	210
	%	1.9%	16.7%	81.4%	100.0%

5. About energy use

228. In the FGDs, the interviewees who would like to introduce their experiences of energy saving are often the women, especially the old ones. They actively talked about how to multiply use the water, how to save the gas during cooking, how to save the electricity when using air conditioner. Although the middle aged and young women are not as thrift as their parents, they easily accept the concept of thrift and energy saving by seeing and learning from their parents. In fact many male interviewees also know energy saving well. It is closely related to the government, the media and the communities' propaganda and education (see Fig 6-1).

229. Women are usually thought as responsible for the housework and related issue. But we found that not only more and more men are sharing the housework with their wives but also some men know clearly about the energy use of their households. They explained that they had the APPs in their smart phone to pay the water, gas and electricity bills. It is easy for them to check the amount of the energy that they have used and the cost they have spent.

230. About the feeling of Xiangtan's winter, there is statistically significant difference between men and women. Women' feeling about coldness is much stronger than men, see Table 6-26. And thus women' demand for central heating is stronger than men, see Table 6-27.

Table 6-26: Women' feeling about Xiangtan's winter

Gender	Item	Very cold	Relatively cold	Neutral	Not too cold	Not cold at all	Total
Men	Count	17	56	101	21	1	196
	%	8.7%	28.6%	51.5%	10.7%	0.5%	100.0%
Women	Count	33	73	85	18	1	210
	%	15.7%	34.8%	40.5%	8.6%	0.5%	100.0%

Table 6-27: Women' demand for central heating

Gender	Item	Need	Don't need	I Don't know, it depends on	Total
Men	Count	74	90	29	193
	%	38.3%	46.6%	15.0%	100.0%
Women	Count	89	83	33	205
	%	43.4%	40.5%	16.1%	100.0%

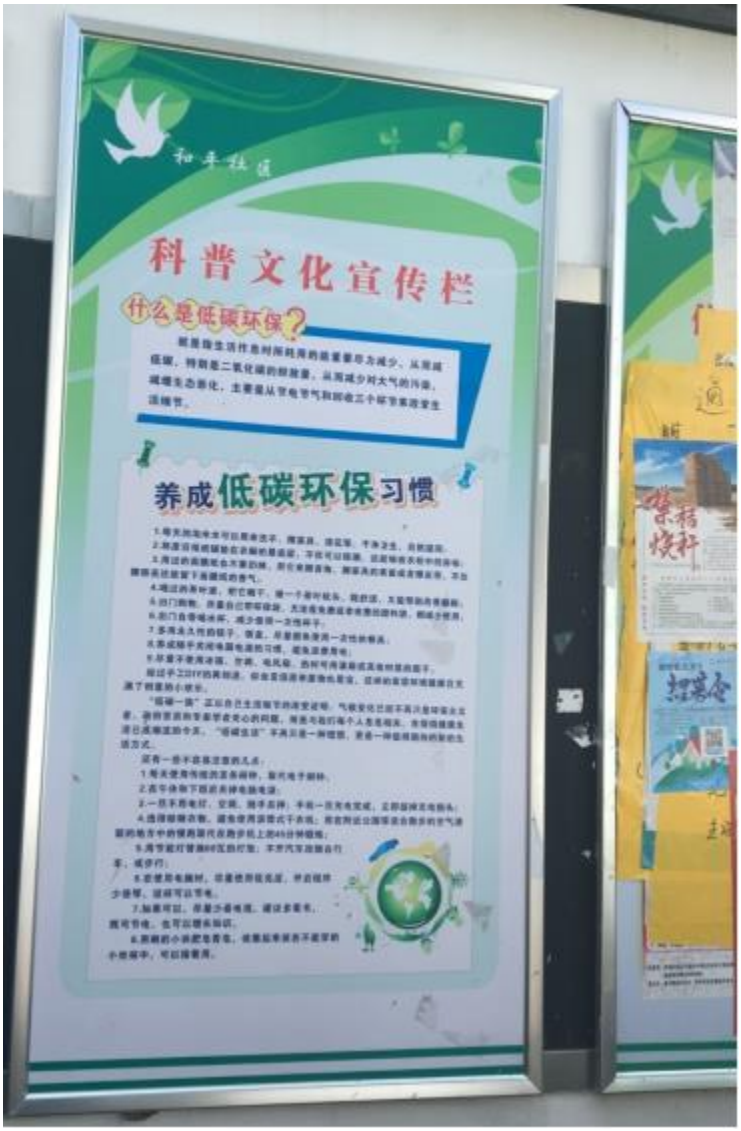

Fig 6-1: Community poster educating residents the tips of low-carbon lifestyle

231. In the FGDs, women said winter in Xiangtan is damp, cold and unbearable. But men said summer is more unbearable. However, there is no statistically significant difference between men and women in the acceptance of central cooling.

Table 6-28: Women' acceptance of central cooling

Gender	Item	Yes	No	I don't know, it depends on	Total
Men	Count	117	57	22	196
	%	59.7%	29.1%	11.2%	100.0%
Women	Count	117	76	17	210
	%	55.7%	36.2%	8.1%	100.0%

232. Previous public activities of old bulbs exchange or energy saving lamps sale with subsidy were welcomed by local residents, so as well the women (see Fig 6-2).

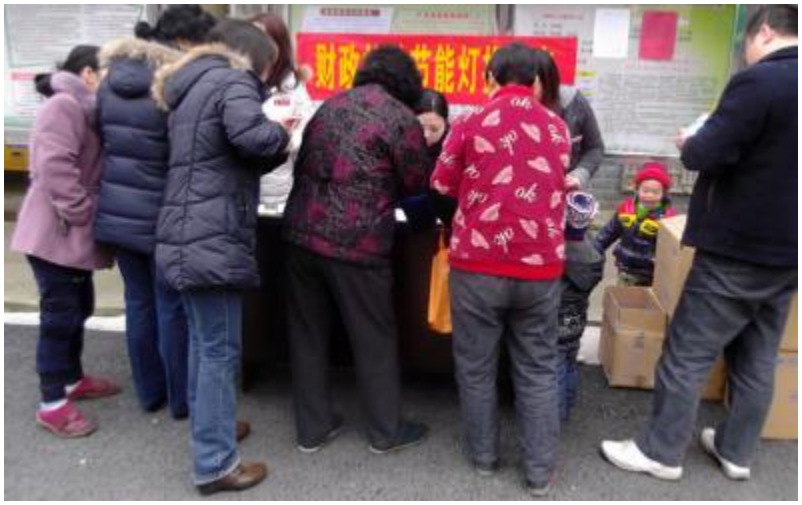

Fig 6-2: Women buying energy saving lamps with subsidy

6. About community sub-project

233. There is statistically significant difference between women and men in their attitude to various community sub-components. According to the following table, the interesting finding is that women concern more about the sub-components related to domestic work like drainage or rubbish while men concern more about the outside. Also women like greening more than men.

Table 6-29: Women' attitude to community sub-project (1)

Option		Upgrading stormwater/sewage pipes		Kitchen waste treatment station		Intelligent waste sorting bins		Domestic waste sorting area		Provide more bins		Community greening	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Very necessary	Count	116	197	84	161	79	159	82	162	78	115	112	207
	%	54.0%	56.8%	39.1%	46.4%	36.7%	45.8%	38.1%	46.7%	36.3%	33.1%	52.1%	59.7%
necessary	Count	49	80	53	99	62	96	60	107	46	84	51	87
	%	22.8%	23.1%	24.7%	28.5%	28.8%	27.7%	27.9%	30.8%	21.4%	24.2%	23.7%	25.1%
Fair	Count	18	46	29	45	25	53	27	44	23	69	24	33
	%	8.4%	13.3%	13.5%	13.0%	11.6%	15.3%	12.6%	12.7%	10.7%	19.9%	11.2%	9.5%
Not that necessary	Count	7	8	13	17	20	13	14	11	25	37	9	7
	%	3.3%	2.3%	6.0%	4.9%	9.3%	3.7%	6.5%	3.2%	11.6%	10.7%	4.2%	2.0%
Un-necessary	Count	25	16	36	25	29	26	32	23	43	42	19	13
	%	11.6%	4.6%	16.7%	7.2%	13.5%	7.5%	14.9%	6.6%	20.0%	12.1%	8.8%	3.7%
Total	Count	215	347	215	347	215	347	215	347	215	347	215	347
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 6-30: Women' attitude to community sub-project (2)

Option		External wall and rooftop insulation		Replace Energy-saving windows and doors		Installation of energy saving street/corridor lamps		Replace water saving facets/toilets		Building ecological parking area	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Very necessary	Count	110	153	89	124	140	208	99	153	96	157
	%	51.2%	44.1%	41.4%	35.7%	65.1%	59.9%	46.0%	44.1%	44.7%	45.2%
Necessary	Count	43	91	46	85	42	98	31	85	53	100
	%	20.0%	26.2%	21.4%	24.5%	19.5%	28.2%	14.4%	24.5%	24.7%	28.8%
Fair	Count	18	46	30	76	9	19	34	51	24	53
	%	8.4%	13.3%	14.0%	21.9%	4.2%	5.5%	15.8%	14.7%	11.2%	15.3%
Not that necessary	Count	15	28	14	27	3	5	14	15	14	10
	%	7.0%	8.1%	6.5%	7.8%	1.4%	1.4%	6.5%	4.3%	6.5%	2.9%
Unnecessary	Count	29	29	36	35	21	17	37	43	28	27
	%	13.5%	8.4%	16.7%	10.1%	9.8%	4.9%	17.2%	12.4%	13.0%	7.8%
Total	Count	215	347	215	347	215	347	215	347	215	347
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

7. About participation

234. The degree of the respondents' involvement in public activities is: environment protection campaign/education (27.4%) > green transportation campaign/education (11.8%) > low carbon campaign/education (7.6%) > public Hearings for tap water/solid waste tariff (2.5%). About half respondents (49.8%) have never actively participated in any public activities. There is no statistically significant difference of men and women in participating in public activities. But from the table below it looks like the degree of women involved in public activities are less than that of men.

Table 6-31: Women' public activities involvement

Gender	Item	Low carbon campaign/education	Environment protection campaign/education	Public Hearings for tap water/solid waste tariff	Green transportation campaign/education	Others, please specify	Never	Total
Men	Count	17	78	11	26	2	91	225
	%	7.6%	34.7%	4.9%	11.6%	0.9%	40.4%	100.0%
Women	Count	18	65	6	28	2	118	237
	%	7.6%	27.4%	2.5%	11.8%	0.8%	49.8%	100.0%

235. 61.9% of women thought the media publicizing is the most effective way in raising the public awareness of low carbon lifestyle. Special promotional activities (15.7%) will also contribute, and then training (9.5%), post (7.1%) and booklet (2.4%) will play their roles. There is not statistically significant difference between men and women.

Table 6-32: Effectiveness of various measures

Gender	Item	Training	Media publicizing	Post	Booklet	Special promotional activities	Others	Total
Men	Count	10	136	6	9	28	7	196
	%	5.1%	69.4%	3.1%	4.6%	14.3%	3.6%	100.0%
Women	Count	20	130	15	5	33	7	210
	%	9.5%	61.9%	7.1%	2.4%	15.7%	3.3%	100.0%

236. About half women (46.7%) prefer to be involved in low carbon related activities through watching TV publicizing. There is not statistically significant difference between men and women in the activities that they want to be involved in. However, from the table below, it looks like women prefer to attend the community-organized activities while men prefer the unit-organized activities.

Table 6-33: Women' willingness of activities to be involved in

Gender	Item	Receive training	Receive the booklet	Watch TV publicizing	Read the post	Your community-organized activities	Your unit-organized activities	Others, specify	Total
Men	Count	9	14	101	3	26	41	2	196
	%	4.6%	7.1%	51.5%	1.5%	13.3%	20.9%	1.0%	100.0%
Women	Count	14	9	98	5	46	35	3	210
	%	6.7%	4.3%	46.7%	2.4%	21.9%	16.7%	1.4%	100.0%

D. Women' demands for the Project

1. Women' attitude

237. Female respondents prefer green travel > green building > central cooling > central heating. There is no statistical significant difference between men and women.

Table 6-34: Women' attitude to sub-projects

Item	Gender	Not necessary	Somewhat necessary	necessary	Very necessary
Green travel	Men	1.5%	13.8%	46.9%	37.8%
	Women	1.0%	8.1%	47.6%	43.3%
Green building	Men	8.2%	20.9%	40.3%	30.6%
	Women	4.3%	22.4%	41.0%	32.4%
Central cooling	Men	37.8%	26.5%	20.9%	14.8%
	Women	33.3%	24.8%	29.0%	12.9%
Central heating	Men	43.9%	24.0%	20.9%	11.2%
	Women	36.7%	24.3%	24.8%	14.3%

2. Women' ability and willingness to pay

a. Women' ability to pay

238. Considering that women often have the same income with or less income than the man when their conditions are similar, if they travel the same trips per month, the percentage of women' bus fare in the monthly income would be higher than that of men'.

239. Considering that the proportion of women whose income is lower than 3,000 Yuan/month is higher than that of men, it means the potential bus fare rate increase will affect more low income women.

b. Women' willingness to pay

(1) Bus fare

240. There is not statistically significant difference between men and women in the willingness to pay for improved bus service. About 2/3 women (65.2%) prefer to keep the present bus fare. About 1/5 women (22.4%) can accept the bus fare increase for better bus service, most of which accept the bus fare at 3 Yuan/person • time. A few women (11.4%) think the bus fare should be 1 Yuan/person • time. Like women in the FGDs questioned, why the bus fare keeps the same for the whole year. They thought the fare should be lower in the spring and autumn because air conditioner was not used in these seasons.

Table 6-35: Women' willing to pay for improved bus service

Gender	Item	0	1	1.5	2	2.5	3	4	5	Total
Men	Count	2	11	0	141	2	33	6	1	196
	%	1.0%	5.6%	0.0%	71.9%	1.0%	16.8%	3.1%	0.5%	100.0%
Women	Count	1	24	1	137	1	40	2	4	210
	%	0.5%	11.4%	0.5%	65.2%	0.5%	19.0%	1.0%	1.9%	100.0%

(2) Parking rate

241. There is not statistically significant difference between men and women in the willingness to pay for improved parking service.

Table 6-36: Women' willingness of parking rate in the community

Gender	Item	0	1	2	3	4	5	8	10	Total
Men	Count	64	4	9	3	2	15	1	1	99
	%	64.6%	4.0%	9.1%	3.0%	2.0%	15.2%	1.0%	1.0%	100.0%
Women	Count	59	7	2	7	0	12	0	0	87
	%	67.8%	8.0%	2.3%	8.0%	0.0%	13.8%	0.0%	0.0%	100.0%

Table 6-37: Women' willingness of parking rate in the workplace

Gender	Item	0	1	2	3	4	5	8	10	Total
Men	Count	64	3	9	3	1	16	1	1	98
	%	65.3%	3.1%	9.2%	3.1%	1.0%	16.3%	1.0%	1.0%	100.0%
Women	Count	60	8	2	4	0	13	0	0	87
	%	69.0%	9.2%	2.3%	4.6%	0.0%	14.9%	0.0%	0.0%	100.0%

Table 6-38: Women' willingness of parking rate in the downtown area

Gender	**Item**	**0**	**1**	**2**	**3**	**4**	**5**
Men	Count	0	3	9	14	1	58
	%	0.0%	3.1%	9.3%	14.4%	1.0%	59.8%
Women	Count	2	4	7	12	0	54
	%	2.3%	4.6%	8.0%	13.8%	0.0%	62.1%
Gender	**Item**	**6**	**8**	**10**	**15**	**20**	**Total**
Men	Count	1	2	8	1	0	97
	%	1.0%	2.1%	8.2%	1.0%	0.0%	100.0%
Women	Count	2	1	4	0	1	87
	%	2.3%	1.1%	4.6%	0.0%	1.1%	100.0%

(3) Community sub-component

242. There is not statistically significant difference between men and women in the willingness to pay for some community sub-components closely related to individual households, i.e. external wall and rooftop insulation, replacing energy-saving windows and doors, installation of solar hot water panel, and replacing water saving facets.

Table 6-39: Women' willingness to pay for some community sub-component

Option		External wall and rooftop insulation		Replace Energy-saving windows and doors		Installation of solar hot water panel		Replace water saving facets/toilets	
		Male	Female	Male	Female	Male	Female	Male	Female
0	Count	66	101	64	84	55	80	62	82
	%	41.5%	38.5%	40.0%	32.9%	39.3%	35.6%	38.3%	33.1%
0.01-1%	Count	31	52	30	58	24	53	35	61
	%	19.5%	19.8%	18.8%	22.7%	17.1%	23.6%	21.6%	24.6%
1.01-10%	Count	33	63	36	63	29	52	32	56
	%	20.7%	24.1%	22.6%	24.7%	20.8%	23.1%	19.7%	22.6%
10.01-20%	Count	15	20	12	21	12	17	13	19
	%	9.4%	7.6%	7.5%	8.2%	8.6%	7.6%	8.0%	7.7%
20.01-30%	Count	11	7	12	10	12	7	8	8
	%	6.9%	2.7%	7.5%	3.9%	8.6%	3.1%	4.9%	3.2%

30.01-50%	Count	2	15	3	15	3	12	7	19
	%	1.3%	5.7%	1.9%	5.9%	2.1%	5.3%	4.3%	7.7%
50.01-100%	Count	1	4	3	4	5	4	5	3
	%	0.6%	1.5%	1.9%	1.6%	3.6%	1.8%	3.1%	1.2%
Total	Count	159	262	160	255	140	225	162	248
	%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

VII. ETHNIC MINORITY (EM)

243. By 2018, the total population of ethnic minorities in Xiangtan Municipality is about 14,100, accounting for 0.49% of the total municipal population, and 1.3% of the total main city population. Most of them are scattering in the main city. The main ethnic minority groups are Tujia, Miao, Mongolia, Dong, Hui and Yao. Tujia group has the largest population of about 4,300.

244. There were 11 EM respondents (1.0%) in the questionnaire survey, including 8 Tujia people and 2 Miao people. Their answers to various questions did not differ significantly from those of Han respondents.

245. Of the 20 communities involved in the community sub-project, there are 392 EM, accounting for 0.2% of the total population.

246. EMs in the project area will benefit equally from the Project together with Han people. The Project will not have special negative impact on local EMs, and thus there is no need to develop a special ethnic minority development plan.

VIII. SOCIAL AND GENDER ACTIONS

247. The project has been designed to meet ADB's gender mainstreaming category as SGE (some gender elements). Activities outlined in this project gender action plan (GAP) focus on (i) ensuring women' equitable participation in the project including public consultation, (ii) implementing gender-responsive features of the project, (iii) promoting employment and income generation opportunities for women, and (iv) building institutional capacity for gender mainstreaming. Key GAP performance indicators are incorporated into all the project outputs in the project design and monitoring framework. Xiangtan PMO and IAs will be responsible for implementation of the GAP and will make necessary budgetary arrangements, and hire a social/gender specialist to support GAP implementation. Xiangtan PMO will also seek support and coordination from local Women' Federation (WF) for effective implementation of the GAP. The implementation of the GAP will be financed through the project budget and monitored through collection of gender-disaggregated data. Xiangtan PMO will ensure that contractors' bidding documents clearly indicate the gender features outlined in the GAP. The GAP is provided below.

248. Besides, to strengthen poor people's benefits from and improve their participation in the Project, job opportunities created during the construction and operation period are suggested to give priority to local poor people at the same condition. Also, consultation meetings and road safety awareness activities should involve certain amount of local poor.

249. About the affordability, if there is the increase of bus fare in the future, the participation of poor people should be ensured in the price hearing. Also, it is suggested to provide the poor people, e.g. the HHS enjoying MLS allowance with more public transport subsidy or fare waiver.

250. Monitoring and evaluation of social actions will be incorporated into the overall project monitoring and evaluation plan. The social/gender specialist will work with the PMO and IA staff to orient them on the implementation of social actions, prepare quarterly progress reports and consolidate annual report by the PMO. ADB staff with gender expertise will participate in review missions.

Table 8-1: Social and Gender Action Plan

Action	Indicator	Responsible institution	Time	Budget
Output 1: Low-Carbon and Resilient Infrastructure Transformation Demonstrated				
1. Incorporate social and gender-responsive features into the design	(1) Inclusive design to increase the road accessibility and safety, considering of the characteristics and demands of various groups (e.g. the elderly, the disables, the women, the students and the children) (note: ***Inclusive design features*** *include: tactile installation on sidewalks and bus stops; designated spaces at bus stops and buses, and bus ramps for wheelchairs and prams; designated seats for pregnant women, elderly, and children at bus stops and buses; barrier free sidewalks for wheelchairs and prams; wide curb ramps for seamless access for vulnerable people, elevated pedestrian crossings, extended curbs, and extensive street markings and signboards for safe walking and cycling.*) (2) Community sub-components give priority to benefit local poor, e.g. external wall and rooftop insulation, replacing energy-saving windows and doors, installation of solar hot water panel, and replacing water saving facets (3) Local people, especially the poor, can afford the potential bus fare increase and potential cost share of community sub-project	PMO, IAs design institutes, social/gender specialist, WF, DF	2020-2025	Included in the Project
2. Promote wide and effective participation	(1) Various groups to be involved in consultation meetings of design; at least 40% local women to participate in (2) Various groups to be involved in road safety, green travel, climate resilience, energy saving, and low-carbon lifestyle awareness campaign; at least 40% local women to participate in (3) at least 40% local women and 20% local poor to attend the hearing meetings if there is bus fare increase or cost share of community	PMO, IAs design institutes, social/gender specialist, WF, DF, communities	2020-2025	Included in the Project

	sub-project			
3.Provide local people with job opportunities	(1) New job opportunities given to local poor people with priority (2) At least 20% local women to be employed for unskilled jobs created during construction and operation period (3). Qualified female bus drivers would be given priority over male for new opening.	PMO, IAs construction contractors, social/gender specialist, WF	2020-2025	Included in the Project
Output 2：Information and Knowledge Platforms Established for Informed Decision and Behavior Changes				
Incorporate social and gender-responsive features into the design	Inclusive design to consider for the characteristics and demands of various groups	PMO, IAs, social/gender specialist, WF	2020-2025	Included in the Project
Output 3: Capacity Building and Program Management Enhanced				
Increase female staff's capacity of EA and IA	(1) Recruit a social/gender specialist to support SGAP implementation (2) Appoint a PMO staff responsible for SGAP implementation and reporting (3) At least 30% female staff in EA and IA are included in appropriate trainings and workshops	PMO, IAs social/gender specialist	2020-2025	Included in the Project
Output 4: Low-carbon transformation policy reforms adopted				
See the Environment and Social Impact Assessment of Policy Matrix Report				

DF=Disables' Federation, EA=executing Agency, IA=Implementing Agency PMO=Program Management Office, WF=Women' Federation