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The Importance-performance Analysis of Ecotourism Subcomponents Based on Visitor Perspectives in Helena Sky Bridge

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Authors' contributions

This work was carried out in collaboration among all authors. Author Asrianny designed the study, performed the experiment, statistical analysis and wrote the first draft of the manuscript. Authors RS, HSA and DD supervised the experiment and the final draft. All authors read and approved the final manuscript.

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ABSTRACT

Aims: To analyze the importance and performance rate of various ecotourism component based on visitor perspectives in Helena sky bridge.
Study Design: Interview method.
Place and Duration of Study: October 2018 in Helena sky bridge, Bantimurung Bulusaraung National Park, Maros District, South Sulawesi Province, Indonesia.
Methodology: The interview method, by using prepared structured questionnaire with close ended questions, applied on 50 respondents selected through quoted accidental sampling technique. There were 33 ecotourism subcomponents assessed based on Likert scale. Obtained data processed by the Importance-Performance Analysis (IPA) and displayed in Cartesian diagram.
Results: There was variation of respondent characteristics in term of gender, age, number of visits, visiting purpose and domicile. However, most visitor was young people (18-28 years old) and come from Makassar. The highest performance rate was found on panorama, while the lowest

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performance rate was homestay. For the importance, the highest score was showed by 3 subcomponents, namely service, skill and garbage dump, while the lowest one was festival. In average, the performance rate of all subcomponents was 2.70 (moderate), while the importance was 3.93 (good). There was a gap between performance and importance that need proper management actions. Development effort should be concentrated in 7 subcomponents plotted in 1st quadrant, such as the easiness access to get transportation, guide and interpreter, public lavatory, garbage dump, health facility, shopping facility, and clean water availability. 13 subcomponents had already in a good performance, mostly from natural attraction. 10 subcomponents were classed into 3rd quadrant with low priority management strategy. Moreover, 3 subcomponents (cultural landscape, local peoples' daily life and hospitality) were in 4th quadrant with possible overkill situation.

Conclusion: Ecotourism subcomponents such as the easiness access to get transportation, guide and interpreter, public lavatory, garbage dump, health facility, shopping facility, and clean water availability should be prioritized.

Keywords: Bantimurung Bulusaraung National Park; cartesian diagram; interview method; likert scale; structured questionnaire; quoted accidental sampling.

1. INTRODUCTION

As compared to hunting park, grand forest park, nature reserve and wild sanctuary, the national park is the most developed protected area in Indonesia [1]. Previous report by [2] reported Bantimurung Bulusaraung national park as one of favorite national park in Indonesia, indicated by the position as the most popular national park out of Java and top 5 national park in regional level. One of several leading ecotourism destinations in Bantimurung Bulusaraung national park is Helena sky bridge. Helena sky bridge is not functioned as a tourist destination in the beginning time. This place is built as butterflies breeding place. It is located in the left of the main gate of Bantimurung nature tourism area. This breeding place consists of a small dome (60 m^2) and a large dome (7,000 m^2). There are two towers as high as 25 m inside a large dome and both towers are connected by bridges with a length of 45 m and a width of 1 m. In the beginning, this bridge functioned as butterflies monitoring spot. In the past 5 years, this place has become an ecotourism destination with a unique view of butterfly and the background of the karst tower landscape. With this uniqueness, the destination is then called as Helena sky bridge. The name of Helena is taken from one of beautiful butterfly name that found in the Bantimurung area [3]. Previous study by [4] agreed that Helena sky bridge has a high number of visits and this condition is supported by increasing the use of social media in today's society. The number of visitors in Helena sky bridge tended to increase during the past five years. The number of visitors in 2014 was only 927 people and reduced to 337 people in 2015. In 2016, there was a rapid improvement in the term of visitor number to be 4,584 people. The number of visitors in 2017 increased up to 67,512 people and then decreased to be 57 123 people in 2018 [5].

Visitor is the main component of ecotourism management [6]. This component not only can boost the success of ecotourism, but also danger the natural resource surrounding the ecotourism. The number of visitors is one of factor that can determine the sustainability of natural resources and also the quality of visitor experience [7]. Visitor is the center of ecotourism that able to influence the economy, ecology and social condition of managed tourism. The increase of visitor number produces a high income for this business, however this condition endangers the environmental quality. The damage to natural resources is one of main obstacles to get a good tourism experience [8]. The negative effect resulted by the increase number of visitors should be handle by management through the application of a good management strategy. The formulation of strategy should involve the visitor. Visitor is remarkable information resource dealing with actual condition of site and also the impact of management action on their visiting experience [9]. There is an alternative approach to handle visitor, as called by visitor impact management (VIM). VIM is the framework of action that clearly address the importance of combination between judgemental and scientific considerations to formulate effective management [10]. VIM comprised of various step, including the identification of unacceptable tourist effect based on the tourist perspective up to tourist support for potential management

actions [9]. Tourist perspective is valuable information source to map the performance, importance and the gap between both attributes in actual condition.

The tourist perspective research had been frequently reported in various national park, namely Madhav national park in India [11] and Bako national park in Malaysia [9]. However, there is still limited information regarding that research in Bantimurung Bulusaraung national park, especially Helena sky bridge as one of leading destination. This paper aimed to analyze the importance and performance rate of various ecotourism component based on visitor perspectives.

2. METHODOLOGY

The research was held on October 2018 in Helena sky bridge, Bantimurung Bulusaraung National Park, Maros District, South Sulawesi Province, Indonesia. Helena sky bridge is located inside the complex of Bantimurung Bulusaraung National Park (BBNP). It was located 30 km away from the airport of Sultan Hasanuddin, Makassar. From the airport, visitors drove to the north using the province's South Sulawesi route to the Maros Regency. When entering the central area of Maros Regency, visitors turn east and continue towards Bone District until they find the BBNP main gate across the highway. From the BBNP main gate, visitor should turn right after the checkpoint and walk as far as 100 m to the gate of Helena sky bridge is found. The counter of payment was located in the gate of Helena sky bridge. Visitors need to track as far as 200 m from the counter to Helena Sky Bridge. To enter the site, visitor paid IDR 20 000 in weekday and IDR 22 500 in weekend. This site was open every day for public starting from 8 am to 5 pm.

The interview method used in present experiment to collect actual data from respondents based on prepared structured questionnaire with close ended questions. Fifty respondents invited and selected from the actual visitor population who were found on the spot, by using quoted accidental sampling [12].

The questionnaire prepared to explore the actual condition of observed ecotourism components based on visitor perspectives. There were 7 ecotourism components assessed in present experiment, i.e natural attraction, cultural attraction, accommodation, accessibility and transportation, tourism information, public facility, and human resources [13]. There were 3 subcomponents in natural attraction, i.e flora attraction (A1), fauna attraction (A2), panorama (A3) and specific attraction (A4). Cultural attraction consisted of 9 subcomponents, such as local cultural arts (B1), local traditions and customs (B2), festival (B3), historical heritage (B4), carvings and crafts (B5), cultural landscape (B6), local food (B7), local peoples' daily life (B8), and hospitality of local people (B9). For accommodation component, there were 3 subcomponents, like homestay (C1), hotel (C2), and camping ground (C3). Ecotourism component such accessibility and transportation consisted of some subcomponents, such as the easiness access to locations (D1), the easiness access to get transportation (D2), the easiness access to get information about the distance from the nearest city (D3), and transportation cost (D4). Tourism information components consisted of guide and interpreter (E1) and brochures, maps or other directions (E2) subcomponent. There were 8 subcomponents in public facility ecotourism component, i.e public lavatory (F1), garbage dump (F2), rest area (F3), telephone, fax or internet (F4), health facility (F5), security facility (F6), shopping facility (F7), and clean water availability (F8). Service (G1), care (G2) and skill (G3) were 3 subcomponents consisting human resource component.

The assessment of present study followed the Importance-Performance Analysis (IPA) method. The result of assessment was the actual and up to date visitor perspectives on the importance and performance condition for each ecotourism component. Respondents were invited to score both those conditions based on the Likert scale, i.e 1 point for very bad, 2 point for bad, 3 point for moderate, 4 point for good and 5 point for very good [14]. Obtained data were tabulated and then calculated by following formula [15,16].

1. The calculation of mean of performance and importance rate for each component used following formula:

$$\overline{Xi} = \frac{\sum_{i=1}^{k} Xi}{n} \qquad \overline{Yi} = \frac{\sum_{i=1}^{k} Yi}{n}$$

Notes:

$\overline{Xi} =$ The mean value of performance rate of the -i

$\overline{Yi} =$ The mean value of importance rate of the -i,

n = The number of respondents

2. The calculation of mean of performance and importance rate for entire component used following formula:

$$\overline{\overline{Xi}} = \frac{\sum_{i=1}^{k} \overline{Xi}}{n} \qquad \overline{\overline{Yi}} = \frac{\sum_{i=1}^{k} \overline{Yi}}{n}$$

Notes:

$\overline{\overline{Xi}}$ = The mean value of performance rate of the -i

$\overline{\overline{Yi}}$ = The mean value of importance rate of the -i

n = The number of components

The mean value of performance and importance rate for each ecotourism subcomponent were scattered in four quadrants of Cartesian diagram (Fig. 1). The first quadrant was consisted of any observed subcomponents with a high importance rate and a low performance rate. Any observed subcomponents with a high rate of both importance and performance rate were placed in the 2nd quadrant, while the opposite results were scattered in 3rd quadrant. The last quadrant, the 4th quadrant, was for a high performance rate but followed by a low importance rate [15].

3. RESULTS AND DISCUSSION

3.1 Respondent Characteristics

Respondents were actual visitors who found at the time of data collection. They were selected through quoted accidental sampling or non probability sampling method. This sampling method was suitable for any research with the aim to explore more about the variation of idea/responses from invited people rather than what a response of particular proportion of population [17].

This study used involved in present experiment varied according to their gender, age, the number of visit, visiting purpose and domicile (Fig. 1). Male respondents were more dominant that female one, i.e 54% > 46%. Most of visitor (76%) who came to Helena sky bridge were young people with the range of age for about 18-28 years old. This result is similar with previous study by [18] that adventurous destination attracts more wilderness visitors, i.e younger younger people.

Based on their visiting experience, 58% visitor stated that this was their first experience on Helena sky bridge, while 10% among respondent population believed to have more than 4 times visiting experiences. Based on their visiting purpose, for about 82% respondent who went to this destination claimed to have main visiting purpose while the rest was transit ones. None of visitor came from overseas, while most of visitor (69%) was from Makassar and then followed by 19% visitor from out of Sulawesi, 17% visitor from Maros and 14% from out of Makassar.

3.2 Importance-Performance Analysis

The importance-performance analysis (IPA) was firstly launched by [19] to ease the determination of management decision. Later on, this method is widely used, including for ecotourism studies. IPA is a powerful tool to build an optimal model of ecotourism development potential [16]. In average, the mean of performance and importance rate of ecotourism component in Helena sky bridge were 2.70 (moderate) and 3.93 (good), respectively. The highest performance rate was found on panorama, while the lowest performance rate was homestay. For the importance, the highest score was showed by 3 subcomponents, namely service, skill and garbage dump, while the lowest one was festival.

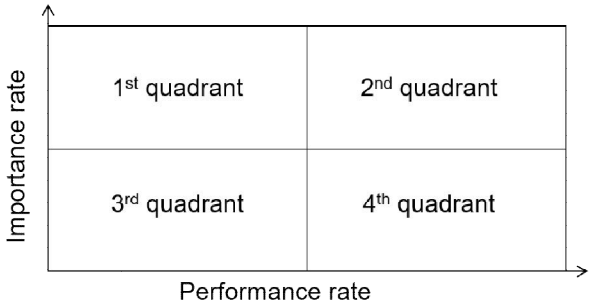

Fig. 1. Four quadrants of Cartesian diagram

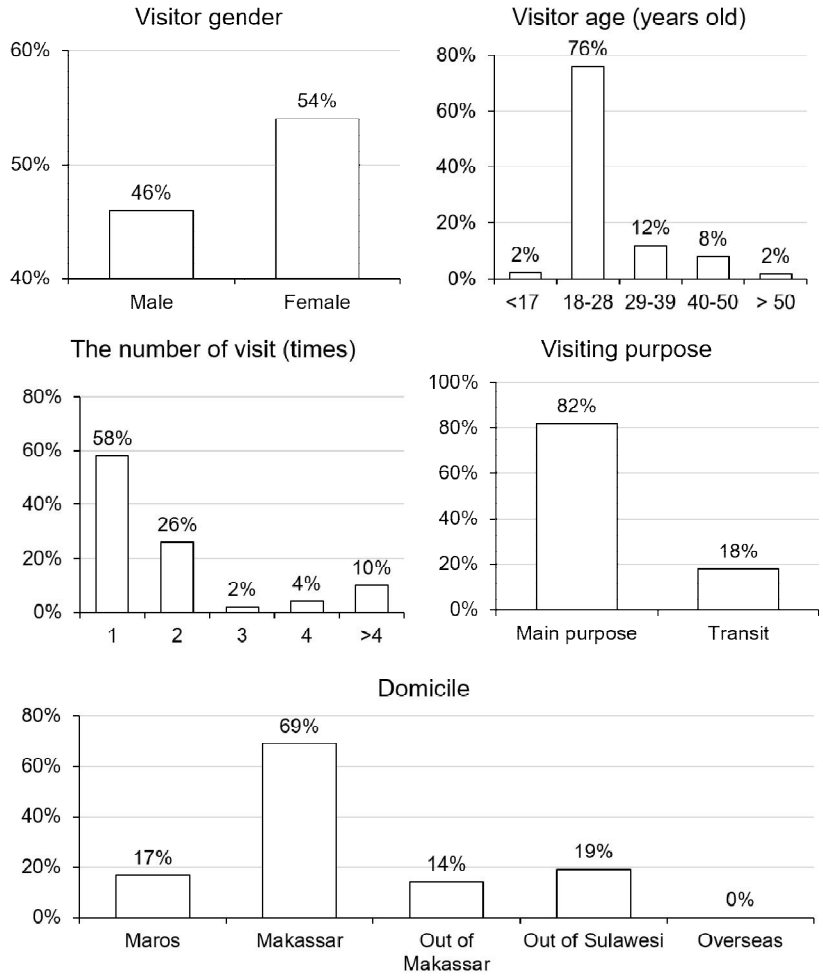

Fig. 2. Bar chart of Helena sky bridge respondent characteristics, based on visitor gender, visitor age, the number of visits, visiting purpose and visitor domicile

The mean performance value of natural attraction was 3.66 (good), while the importance was 4.42 (very good). Panorama was the ecotourism subcomponent with the highest both performance and importance rate in Helena sky bridge. Visitor believed that the view of butterfly combined with karst landscape as background create a fabulous panorama. In term of cultural attraction, the average performance rate was still low, i.e 2.35, while their importance was moderate, i.e 3.35. The lowest performance score was found in local cultural arts, while the highest performance was local hospitality. Visitor believed that the festival was not so much needed in Helena sky bridge, while cultural landscape was good importance. In case of accommodation component, the performance was still very low (1.39) while the importance was moderate (3.01). Both performance and importance rate in accessibility and transportation component was good, i.e 3.46 and 4.17, respectively. Tourism information was believed as important component for visitor, with importance score for about 4.36, however the actual performance condition was still below the importance, i.e only 3.20 (moderate). Moreover, present study revealed that the subcomponent of guide and interpreter was in low performance. The information component indicated how good the manager action to introduce the characteristics of destination and also communicate with visitor on how to enjoy ecotourism without endanger the natural resources [20].

The broader gap between importance and performance was found in public facility component, because the actual performance was

low (2.32) but their importance was high (4.23). The lowest performance rate was found in health facility subcomponent, however this facility was really needed/good importance. The last observed component was human resource with a moderate performance rate (3.45) and a very good importance score (4.55). The detail of performance and importance rate for every ecotourism subcomponent in Helena sky bridge was displayed in Table 1.

All performance and importance rate were later scattered in Cartesian diagram and categorized into 4 quadrants. From one to another, each quadrant had different management strategy. The first quadrant was the most important to take look, because all subcomponent that plotted here was need a lot of action from the manager. The suitable management strategy for 1st quadrant was 'concentrate here', meant all development effort should be address here. This quadrant comprised of several subcomponents, such as the easiness access to get transportation (D2), guide and interpreter (E1), public lavatory (F1), garbage dump (F2), health facility (F5), shopping facility (F7), and clean water availability (F8) (Fig. 3). Those subcomponents, except D2, could improve the quality of visiting experience so that they might be return in the future. The improvement of the easiness access to get transportation (D2) might associate with the increase of number of visitors near future. For instance, the guide and interpreters, especially that provided in more personal services, was needed for achieved the best quality visiting experience in ecotourism [21].

The 2nd quadrant was filled with 13 ecotourism subcomponents, such as flora attraction (A1), fauna attraction (A2), panorama (A3), specific attraction (A4), the easiness access to locations (D1), the easiness access to get information about the distance from the nearest city (D3), transportation cost (D4), brochures, maps or other directions (E2), rest area (F3), security facility (F6), service (G1), care (G2), and skill (G3) (Fig. 3). All mentioned subcomponent believed to have both a high performance and importance rate, so that the proper management strategy was 'keep up the good work'.

Based on visitor perspectives, 10 subcomponents were classed into 3rd quadrant, such as local cultural arts (B1), local traditions and customs (B2), festival (B3), historical heritage (B4), carvings and crafts (B5), local food (B7), homestay (C1), hotel (C2), camping ground (C3), telephone, fax or internet (F4) (Fig. 3). Although all mentioned subcomponents were not in a good performance, the managers no need to focus on the development of those subcomponents, because visitor believed that these subcomponents were not so much needed or low importance for them. The proper management for 3rd quadrant was a low priority management in order to have an efficient energy for more development in 'concentrate here' quadrant.

Three subcomponents, namely cultural landscape (B6), local peoples' daily life (B8), hospitality of local people (B9) were categorized as 4th quadrant. Those subcomponents were not so much needed by visitors, indicated by the lower importance, however they had a good performance rate. This imbalance condition could lead to 'possible overkill' situation.

One of example of the good work in Helena sky bridge was in term of security facility. Visitor satisfied with the security facility because the management paid an extra attention on the security of visitor during the vacation. Several security procedures applied such the limitation of visitor number. The maximum number of visitors per day was 100 people on weekdays and 150 people on weekend. There was also visitor number limitation applied when visitor who want to walk from one tower to another through the sky bridge (Fig. 4), i.e maximum 10 people for one trip. The management team had provided proper meeting point for visitor who wait for a queue. During the waiting time, some operators help visitor to prepare himself, starting from rapid short course on how to enjoy the view in a secure way, and also equipped visitor with helmet, *hardness, webbing and carabiner*. Operators also help the documentation of visitor if applicable. Operators were local people who cooperated and trained by national park managerial team [5]. The involvement of local people was aimed to empower the local communities and also improve their economic status [22].

The high performance on security facility in term of visitor limitation number was also an evidence that Helena sky bridge offered a responsible tourism either for environment or visitor itself. Since ecotourism determined as one of the fastest-growing types of tourism in the world [23] especially in tropical region [24], Helena sky bridge open some opportunities to develop more in the future. The opportunity to move forward is

indicated by the presence of investment interest by several investors [4].

The finding of this study contributed to the development of Helena sky bridge in particular or Bantimurung Bulusaraung National Park in general. The contribution is the enrichment and update of data on which ecotourism subcomponents that need to be upgrade and *vice versa*. The cartesian diagram had classified all observed subcomponents into 4 plots and provided a certain managerial strategy for every plot. The 1st quadrant subcomponents required a lot of concentration and need to develop more to meet the good importance from visitor perspectives. The 2nd quadrant subcomponents required no development action because of its current 'good work condition'. The 3rd and 4th quadrant subcomponents were no longer priority to develop. The managerial team were hope to follow this classification finding for the success and sustainability of Helena sky bridge. There was a double mandate assigned for managerial team, both 'protection' and 'use' [25]. The sustainability of ecotourism development was highly supported by a management action not only to develop more profit but also to conserve natural resources in there [26].

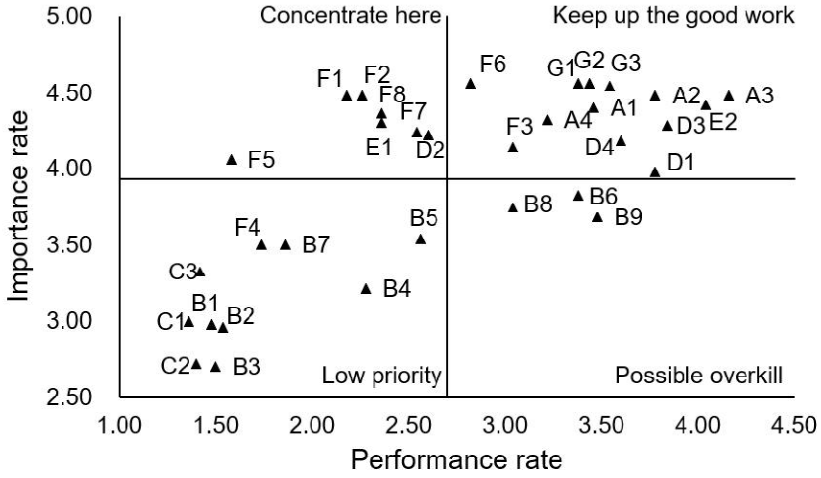

Fig. 3. Cartesian diagram of various ecotourism component in Helena sky bridge based on visitor perspectives

A1 = flora attraction; A2 = fauna attraction; A3 = panorama; A4 = specific attraction; B1 = local cultural arts; B2 = local traditions and customs; B3 = festival; B4 = historical heritage; B5 = carvings and crafts; B6 = cultural landscape; B7 = local food; B8 = local peoples' daily life; B9 = hospitality of local people; C1 = homestay; C2 = hotel; C3 = camping ground; D1 = the easiness access to locations; D2 = the easiness access to get transportation; D3 = the easiness access to get information about the distance from the nearest city; D4 = transportation cost; E1 = guide and interpreter; E2 = brochures, maps or other directions; F1 = public lavatory; F2 = garbage dump; F3 = rest area; F4 = telephone, fax or internet; F5 = health facility; F6 = security facility, F7 = shopping facility; F8 = clean water availability; G1 = service; G2 = care; G3 = skill

Fig. 4. The panorama of Helena sky bridge view from above

Table 1. The mean value of importance and performance rate of all observed ecotourism subcomponents in Helena sky bridge

No	Ecotourism subcomponent	Mean value	
		Performance	Importance
A	Natural attraction		
A1	Flora attraction	3.46	4.40
A2	Fauna attraction	3.78	4.48
A3	Panorama	4.16	4.48
A4	Specific attraction	3.22	4.32
B	Cultural attraction		
B1	Local cultural arts	1.48	2.98
B2	Local traditions and customs	1.54	2.96
B3	Festival	1.50	2.70
B4	Historical heritage	2.28	3.21
B5	Carvings and crafts	2.56	3.54
B6	Cultural landscape	3.38	3.82
B7	Local food	1.86	3.50
B8	Local people daily life	3.04	3.74
B9	Local hospitality	3.48	3.68
C	Accommodation		
C1	Homestay	1.36	3.00
C2	Hotel	1.40	2.72
C3	Camping ground	1.42	3.32
D	Accessibility and transportation		
D1	The easiness access to location	3.78	3.98
D2	The easiness access to get transportation	2.60	4.22
D3	The easiness access to get distance information from the nearest city	3.84	4.28
D4	Transportation cost	3.60	4.18
E	Tourism information		
E1	Guide and interpreter	2.36	4.30
E2	Brochures, maps or other directions	4.04	4.42
F	Public facility		
F1	Public lavatory	2.18	4.48
F2	Garbage dump	2.82	4.56
F3	Rest area	3.03	4.14
F4	Telephone, faximile or internet	1.74	3.50
F5	Health facility	1.58	4.06
F6	Security facility	2.26	4.48
F7	Shopping facility	2.54	4.24
F8	Clean water availability	2.36	4.36
G	Human resource		
G1	Service	3.38	4.56
G2	Care	3.54	4.54
G3	Skill	3.44	4.56

4. CONCLUSION

Based on visitor perspectives in Helena sky bridge, the mean value of importance score of all subcomponents was 3.93 (good importance/needed), while its performance was lower, i.e 2.70 (moderate performance). Due to the gap, the management should formulate management strategy. IPA approach revealed that all development effort should be concentrated in 7 subcomponents plotted in 1st quadrant, such as the easiness access to get

transportation, guide and interpreter, public lavatory, garbage dump, health facility, shopping facility and clean water availability.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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