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Institute of Engineering

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# Climate Change and Energy at Chandragiri Hills Pvt. Ltd.

By

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# A REPORT

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## **1. About Chandragiri Hills**

Project Title Thankot- Chandragiri Cable Car Project

- Project Brief This project is designed to emerge as the prime recreational destination in Nepal by developing Cable Car, Amusement Park & Resort at the scenic location of Thankot as the bottom station to Chandragiri Hill as the top station. Main features of the project include: 1. Cable Car Bottom station at Thankot (Altitude 1569m) Top station at Chandragiri hill (Altitude 2520m m) Length = 2450 m Capacity= 500 person/hr (initial) and 1000 person/hr (final) Trip time: 9 minutes 2. Shiva Temple and World Holy Sanctuary / Meditation Center at Top Station 3. 100 bed luxurious resort at Top Station 4. Restaurant, Viewing Tower and 4D Theater at Top Station 5. Amusement Park, Restaurant and Musical Fountain at Bottom Station
- Project Progress
  Acquired 36 hectares of forest land for lease period of 40 years. Purchased about eight acres of land at Thankot (Bottom station). Declared as National Priority project by National Planning Commission. Completed EIA Study and received approval from concerned authority. Completed Techno-Economic Feasibility Report. Completed Topographical survey. Finalised an agreement with Dopplemayr Seilbahnen GmbH, Austria for supplying, installation and commissioning of Cable Car. Final Stage of DPR by consultant Design Cell Completed Geotechnical Investigation Survey by NESS. Deep boring for water, installation of 11KVA line and hiring of civil contractors for construction works are on process.

Location Thankot VDC, Kathmandu, Nepal.

Source: (FNCCI, 2014)

Chandragiri Hill, seven kilometres from Thankot, lies on the South-West of Kathmandu Valley and is 2551 metres from sea level. Soaring peaks and breath taking views of whole Kathmandu Valley covered with lush green blanket of flora makes Chandragiri truly a great bountiful and pristine landscape. The panoramic views of Kathmandu Valley & Himalayan ranges from Annapurna to Everest makes any one feel like seeing whole Nepal from this hill.



Figure 1 Bhaleshwor Mahadev

#### 1.1. Mythological Significance

With reference to the description written in Himvatakhanda, Bhaleshwor Mahadev appeared at the spot where Satidevi's 'Bhala' or the forehead fell off from her dead body. It is believed that Satidevi, Shiva's consort, gave up her life by jumping in a fire pyre at her father Daksha Prajapati's yagna (sacred fire ritual) after Daksha insulted her husband Shiva in front of scores of gods and goddesses invited at the

religious ceremony. An enraged Shiva then carried her dead body on his back and walked across the world like a madman for long span of time, without taking note of Satidevi's decaying body. Different 'shakti-centres' were established at sites where different parts of Satidevi's body fell in course of Lord Shiva's mourning.

A temple was erected at the same site where Bhaleshwor Mahadev appeared. The legend of Bhaleshwor Mahadev is also associated with Gandharva, a low ranking Hindu deity, named Sumukha. Sumukha forcedly kissed Rambha, an angel who had recently retired as a courtier at Heaven, believed to be Indra's (king of gods) kingdom. Rambha then cursed Sumukha for his misdemeanor after which he was forced to live on earth leaving his abode in the heaven. Sumukha was wandering around the mortal world while living the curse when met with a sage, Galab, who suggested a way out for Sumukha to repent and break the curse. Sage Galab advised Sumukha that he should offer prayers before Bhaleshwor Mahadev after purifying himself every day as penance. Fortunately, in due course, Mahadev was pleased and he blessed Sumukha, following which he settled down with Rambha. Sumukha was also taken in as a close aide by Bhaleshwor. The Himvatkhanda also has another folklore tied in with the Bhaleshwor Mahadev. A Brahmin named Birupas was suffering from leprosy as a result of the sins he had committed in his past life. The leper Birupas was wandering aimlessly in his misery when he came across Sage Nemuni who advised him to visit 64 Shiva lingas as atonement for his transgressions. Birupas is said to have visited Bhaleshwor while making rounds of 64 different Shiva temples.

It is believed that the people who come here to worship Bhaleshwor get their wishes fulfilled and that they will find abode in the Shivaloka or Lord Shiva's world in their afterlife.

#### **1.2. Historical Significance**

Chandragiri hills carry historical significance as well. It was from these hills that King Prithivi Narayan Shah caught the first glimpse of a much scenic and prosperous Kathmandu valley, which in fact instilled in the king's mind an idea of annexing the valley into his kingdom. According to folklore, Prithivi Narayan Shah is believed to have amassed spiritual powers for unification process after undergoing rigorous 'sadhana' or meditation at these very hills. The Gorkhali King disguised himself while ascending the hills in order to avoid being recognized by the Malla Kings of Kathmandu Valley.

In his 'Divyopadesh' (Divine Preaching), it has been mentioned that King Prithivi Narayan Shah was determined to first annex and then make Kathmandu the capital of unified Nepal. He apparently first saw the valley while on his way back to his kingdom in Gorkha from his in-law's realm in Makwanpur. Astrologers Bhanu Aryal and Kulananda Dhakal who accompanied the king during that trip had made a prediction that their king's wish to takeover Kathmandu would definitely come true. As per popular belief, pleased with his perseverance and Sadhana, it was Bhaleshwor Mahadev that granted King Prithivi Narayan Shah his wishes.

Source: (Chandragiri Hills, n.d.)

#### Local people benefitted

Stating Chandragiri hills hold both historical and cultural significance, Dhakal assured that the project developers were committed to developing an eco-friendly tourism destination that could generate job opportunities for the locals.

#### 1.3. Environmental impact of Chandragiri cable cars

Prior to the introduction of the cable car service, only a few people of the city have reached atop this hill. A foot trail leading to Chitlang passes through this hill and this was the only route to reach atop the hill. Again, climbing up the steep hill is not an easy job. Hence, only the people of Chitlang village of Makwanpur district, who used to frequent Kathmandu, were lucky to reach the hill and enjoy the beauty it offers. The cable cars move right above the narrow foot trail of stone steps. The hill is seven kilometers above Thankot where the station of the cable car is located. One has to pass through a rough road from Thankot to reach this station. The total distance from Kathmandu to the cable-car station is around 16 km. One reaches atop the hill in nine minutes from the cable car enjoying the scenes of green hills and the city. If you want to trek instead of using the cable car, you require a three-hour walk along the narrow trail that climbs up through the thick forest. However, one has to be mindful about the risk of encountering a leopard while trekking alone.

However, the massive construction work that is going on might degrade the environment of the pristine hill. Likewise, the new fair-weather road that reaches the top of the hill has also been a polluting agent to the beautiful hill.

Source: (Gautam, 2017)





The share of energy consumption in the transport sector comes to about 5.2% of the total energy consumption in Nepal. The contribution of electricity in these sectors is minimum and comes to about 0.1% only. It is used mainly to run cable cars, ropeways ad trolley buses, which are very few in the country. (WECS, 2010).

#### 1.5. Feasibility study of cable car

Earlier, Ministry had conducted the feasibility study in Chandragiri, Shivapuri of Kathmandu, Fulchoki of Lalitpur, Gosaikunda of Rasuwa, Kalinchowk of Dolkha, Muktinath of Mustang, and Resunga of Gulmi District. Despite having possibilities all these places where the feasibility study were conducted by the Ministry, only Chandragiri of Kathmandu was shown interest by the private sector. (NICCI, 2012)

# 1.6. The main vegetation in Chandragiri hills

- *Quercus lanata* dominating the upper hill slopes of Phulchowki, Shivapuri, and Chandragiri.
- *Rhododendron arboreum* on the reaches of the valley hills, e.g., Phulchowki, Nagarjun, and Chandragiri

# 2. INTRODUCTION

Doppelmayr is the world leader in ropeway engineering and has production facilities and sales and service locations in over 33 countries and to date has built more than 14,300 installations in over 87 countries.

From crossing rivers, climbing mountains, and bypassing and reducing traffic congestion, Doppelmayr is committed to helping cities resolve their transportation and mobility needs.

One may be familiar with the use of ropeways on mountains. This is where much of modern ropeway technology existed and developed over the past hundred years. Today, that same technology is being brought down from the mountain and being incorporated into cities as an integral part of urban public transportation networks on nearly every continent.

Some cities have quickly adopted cable as a cost-effective, quickly-implemented, low-footprint, and safe mode of urban transportation. Yet, in most instances the technology is still highly misunderstood.

There are numerous examples of urban aerial cable systems in the world today. While all are located within cities, each vary in terms of network integration and target ridership

- Portland Aerial Tram
- Caracas Metrocable
- Emirates Air Line
- Koblenz Rheinseilbahn
- Algerian Télécabines
- Singapore Cable Car
- La Paz Metrocables

According to the UN-HABITAT, approximately 50% of the world's population lives in cities, and this figure will increase to 70% in less than a generation.

As a result of growing commuting distances and urban sprawl, metropolitan areas are becoming ever more complex -- and existing transport infrastructures are increasingly pushing capacity limits.

Doppelmayr understands that. For this reason, it is essential to find new solutions to current and future transport problems. Aerial ropeways can be part of the solution by providing an innovative and attractive approach to public transport.

# 2.1. Cable Transit

Cable transit is a transportation technology that moves people in non-motorized vehicles (cabins) propelled by a cable. Cable transit is a basic technology that over the last hundred years has experienced dramatic upgrades, formalization, and innovation, to the point where cable transport technologies are high tech and widespread. In the last seven years, several cities around the world have discovered the benefits of cable transit. Dozens of systems have already been built. And many more cities are contemplating, proposing, and studying the benefits of using ropeways as a part of their public transit systems.

# 2.2. Accessibility and Safety

Cable transit vehicles either come to a standstill (fixed grip systems) or pass through stations at a crawl speed (detachable grip systems). This allows riders to board and alight with ease, including riders with walkers, wheel chairs, strollers, luggage and bikes. Kids and seniors alike can all enjoy riding cable transit. Although rarely necessary, a gondola system can be brought to a complete stop by the station attendant in order to service individuals with severe mobility challenges.



Figure 2 Safer and Accessible Cable Car

#### 2.3. Cost Comparison of Cable Transit

Generally speaking, the cost of cable transit is about 1/3 to 2/3 the cost of other standard fixed link transit (all things being equal of course). Costs provided should not be considered conclusive, but rather are approximate — offered as a general guide. When estimating any public transit infrastructure, authorities, planners, and decision makers must consider a wide variety of variables in their local context before arriving at final values. While the cost of cable transit infrastructure is relatively straight forward, land acquisition, civil and customization costs will factor in. Operations and maintenance costs also differ based on country (wages); technology (number of stations and therefore attendants); and usage (major replacements are effected by usage.)

#### 2.4. Ecological Footprint of a Ropeway:

A ropeway is based on the principle of continuous movement. As such, it is a closed system which does not require energy to move its dead weight. Ropeways only require energy to overcome mechanical friction and to move uneven payloads on the uphill/downhill sides. This means there are no losses of braking energy from carriers travelling downhill as found, for example, in the case of buses. Furthermore, ropeways/Cable Liners do not produce local emissions of pollutants during operation.

# 3. Geography and environmental aspects

#### **3.1. Geographical Setting**

Chandragiri is one of the tall hills in south-west surrounding Kathmandu valley. The project, *Chandragiri Hills* is located at top of the hill, which is a recreational destination that comprises of cable car, restaurants, resort, multipurpose hall and branded shops. (Chandragiri Hills, 2016) The altitude of hill top retreat is 2551 meters above sea level, hence exhibits drastic and abrupt weather changes. The hill is steep in nature and is covered by forest. Towards north, Himalayan range is observable. Dhawalagiri and Langtang are distinctly visible in north. Prevailing wind blowing from west to east direction exhibits the clearing of thick pollution (aerosol) blown as the day temperature rises, conditions of aerosol traveling towards north-east direction evident during 13:30 (Mid-January).



Figure 3: Topography and Aerial image. Urban sprawl of Kathmandu valley extending towards foot of hills; view towards NE. New roads scaling

Cable car or *gondolas lifts* and road are means to reach to top of the hill. The construction of cable line has followed ridge of hill, from top the hill to bottom station. It was noticed during our visit, the vegetation along the cable line has been destructed. Transportation of materials during construction had caused the loss of vegetation along the line, roughly about 5 meters. It is vital of a project of this scale to be carried out in accordance with various environmental assessments.

#### **3.2. Response to Environment**

This project is situated amidst the forest and settles at top of the hill. It is of best intent to address and incorporate eco-friendly strategies while fulfilling functional requirements during design and construction. Issues addressing natural components and resources, such as forest (vegetation), wildlife, water sources, soil conservation, should be taken into consideration while conducting intervention. Land use change impacts natural balance of geology and natural environment. Change in ground water percolation, flow and discharge of rainwater, ground water level are few geological alteration which might be triggered due to intervention in land use. These alterations can inflict loss of soil, decreased soil humidity, unfavorable conditions for growth of vegetation, growth of invasive vegetation and other natural hazards due to forest degradation and landslide.

#### 3.3. Built environment

Design, use of material and its relation to climate and surrounding are basis for configuring built environment. It was found that, the facility which is built in contours, has majority use if concrete and industrial material. Hard landscape with pockets of soft patches of artificial turf/ grass has been mostly used. The road is also reinforced with cement concrete, while the paving have use of tile and stone. The joint work and the material reduce penetration of rainwater to earth and increases surface runoff. Drainage of catchment area is run along road side drainage. Due to sloping terrain, the velocity of surface runoff is relatively higher than that in forest, where tree canopy and surface vegetation work to reduce rainwater velocity. The gushing water, during heavy



Figure 4: Panoramic view; impervious surface treatment

aquifers. Infiltration of water in ground and water retention of soil depends on nature of surface. When the ground cover consist of vegetation, leaves and litter shade soil from direct sunlight, allowing the soil to retain moisture for longer period, and maintaining hydrological soil balance. However, when the ground surface is treated with impervious material, rain water cannot percolate ground hence prohibits recharging of aquifers. Similarly, while constructing road and drainage, care should also be given to natural contours. The land forms dictate flow of water, hence, it is essential to work with the contours so as not to intervene natural flow.

#### 3.4. Natural environment

The forest vegetation surround hill top has been cleared for construction of this recreational retreat. Eco-friendly design and construction practice should be accompanied while contemporizing building with nature. Minimal intervention to the natural setting should be taken into consideration while planning, designing and construction of the project.

Cutting of contours to create road and flat areas have resulted in steep embankments. Use of vegetation such as bamboo was found to have been planted in areas of steep slopes. The use of geo-retention technique to retain soil and plantation by bamboo-woven-fence has also been done. Similarly, few steep road sides have polymer mesh laid along the maintained soil level, planted

with vegetation at regular intervals.

Edge condition or boundary condition of construction and forest has little or no buffer, and the differences in their nature of interaction with environmental entities seldom work together. Uses of natural buffers not only provide smooth transition to landscape but also may be used as barrier for human intervention.

Geo-engineering science is closely knit with scope of use of natural elements as solution. Plantation of deep and extended rooted plants aids in confining soil and nourishing it. Together with the vegetation, the condition can give rise to suitable environment for various organisms, thus sustaining soil biology and biodiversity.



Figure 5: A: Base of the tree is damaged by fire. Half of the trunk carries the tree. B: Sign of soil erosion by gushing water from road. Temporary use of stones to lessen the abrasion of water. C: Cutting of hill backed by retaining wall, above which has been covered with polymer mesh, in portions.

#### 3.5. Strategies and Recommendations

The use of electricity powered cable car is clean way for transportation. Promotion of travel based on trekking and trail can make positive contribution on protection of environment.

Since, water is now being pumped from lower sources, strategies to collect rainwater and water reuse is can be effective way of water consumption. Road side drainages can be channeled to series of tanks which aids in cleaning water and also reduce water velocity. Use of baffle along drainage channel also aids in reduction of water velocity.

Similarly, landscape can accommodate water retention ponds which will retain water making water available for ground percolation for longer period. Porous joint work in ground surface



Figure 6: Soil retention strategy adopted

treatment, like stone, brick paving with pervious joint, not like cement mortar, can be adopted. Working with trees and natural landscape is elemental in minimal intervention of natural setting.



Figure 7: Surface drainage management. Collection, storage and treatment of rainwater.

# 4. Technology

# 4.1. Ropeway technology

# A brief history of Ropeway in Nepal:

The history of ropeways traces back to 1922 when it was constructed with an objective to provide facilities for the populace and to replace human and animal power as a means to traverse the difficult terrain. The 22 km long ropeway was started by then Shree Tin Maharaj Chandra Shumsher linking Dhorsing - Chisapani - Chandragiri hills passing into Kathmandu. Later in 1964, the system was further extended upto 42 km to Hetauda, which was operational still in1991. The ropeway transported many goods such as food, construction materials and heavy goods at the rate of 22.5 tons of freight per hour (Photius, 2005).

In the plight where there is wide use of roads in transport sector of Nepal, few ropeways have been built; Bhattedanda and Barpak and Manakamana passenger Ropeways. However there are many agencies that carried out the feasibility study in the past to explore the possibilities of the different types of ropeway in Nepal. Ropeway and cable car has also added that construction of 600m long Kushma-Balewa Cable car in Parbat district with capacity to carry 1000 people per day has been finished and it in operation since February 2013. The most interesting and proud thing about this cable car is that it was completely designed by a team of Nepali Engineers. Apart from Motor ad Drive, all mechanical accessories were fabricated in Nepal (Ropeway & Cablecar, 2017).

Brief about Chandragiri hills



Figure 8: Cable car on operation



Figure 9: cable cars at the station

Chandragiri cable car has two stations; bottom station at 1465m asl and top station at 2520m asl. It has 11 towers and 38 cable cars which has the capacity of 1000 passenger in just one hour. Also it has 2 freight carriers and 1 maintenance carrier. The length of cable car from Godam (Thankot) to Chandragiri hill is 2.5 km which it can cover within 9-11 minutes. Meanwhile it takes 7km of rough road drive or 3hrs trek to reach the top (chandragirihills, 2016). More interestingly, the distance between tower seven to eight is about 900m, which is one of the longest distances between towers and shall provide thrilling experiences to the passengers (Dhakal, 2015). An Austrian Company Doppelmayr constructed cable car in around 3 yrs. (2011-2014) including the halt caused by Gorkha earthquake. The Chandragiri Hills Ltd is planning for some interesting adventurous technologies like paragliding to Chitlang, Makwanpur district and zip-line to Chakhel.

## 5. Social and economic aspects

According to the World Bank (2013), 798,000 number of tourists arrive in Nepal. The tourist from around the world visits Nepal to enjoy its extraordinary beauty. Nepal comprises various thrilling, exciting and beautiful destinations among them Chandragiri Hill Pvt. Ltd has been able to establish itself as a major tourist attraction destination in Kathmandu Valley. (Thapa, 2015) With four million residents of Nepal's capital city of Kathmandu struggling to find open spaces to relax and refresh inside the city, the surrounding hills have become a favorite hotspot to escape the hullaballoo. The opening of Nepal's second cable car service at the Chandragiri Hill station on the south-western rim of the Kathmandu Valley has provided the opportunity for city dwellers to escape the din and ride to a ridge at the top of the hill in relative comfort. Before the operation of the cable car service, the hill station was a popular destination for hiking. Though Chitlang, one of the nearest village of Chandragiri received a large number of tourists as it has developed the concept of home stay of late, only fewer people reached at the top due to lack of good road facility and hotel services. (Thapa, 2015) With the available Cable Car service, this place has become the center of attraction for all kind of tourists in Kathmandu. (Sahayogee, 2016). Chandragiri Hill, which stands at 2,551 meters above the sea level, offers a breath-taking panorama of the Himalayan range and its lush green forests, and visitors can enjoy a splendid view of most of the Kathmandu valley. There is a nice place to take photos, benches to rest and panorama board of mountains Manaslu, Ganesh Himal and Langtang ranges. On a clear day, a row of Himalayan peaks extending from Mt. Annapurna in the west to Mt. Everest in the east can be viewed from the top, with the mountains often blanketed in fog propelled by swirling winds.

Chandragiri Hill is a perfect place to come and visit with family and friends. On top of the hill there's a fun park, a temple and restaurants, all of which cater to both fun lovers and pilgrims. The place is also disabled friendly for wheelchair.





Figure 11: Children Fun Park

Figure 10: Chandragiri Cable car

The advantage of coming to this hill is that visitors can spend a whole day here and return to Kathmandu city on the same day. The hill is located just 16 km away from the center of Kathmandu. Nepal's first cable car service, the Manakamana Cable Car, located in the western Gorkha district, has been attracting huge crowds since it went into operation in 1998. Large numbers of pilgrims frequently visit one of the most famous religious shrines called Manakamana located at the top of hill using the cable car. The new cable car service at Chandragiri, however,



Figure 12: View Tower

attracts a range of visitors including those just looking to enjoy a day out, and has been attracting a large number of visitors since the opening of the service. The operation of the cable car has also supported the local economy, with restaurants opening near the base of the cable car station targeting the visitors. There is a children's amusement park, pilgrimage site

at Bhaleshwor Mahadev Temple, view tower, boutique hotel, botanical garden, shops, theatre and disabled-friendly infrastructure.

# 5.1. Religious Significance: Bhaleshwor Mahadev

With reference to the description written in Himvatakhanda, Bhaleshwor Mahadev appeared at the spot where Satidevi's "Bhala" or the forehead fell off from her dead body. It is believed that Satidevi, Shiva's consort, gave her life by jumping in a fire pyre at her father Daksha Prajapati's yagna (sacred fire ritual) after Daksha insulted her husband Shiva in front of scores of gods and goddesses invited at the religious ceremony.



Figure 13: Bhaleshwor Mahadev newely constructed temple



Figure 14: Traditional Idols

An enraged Shiva then carried her dead body on his back and walking across the world like a madman for a long span of time without taking note of Satidevi's decaying body. Different "Shakti-centres" were established at the sites where different parts of body fell in course of lord Shiva's mourning. A large number of people from different parts of the country thronged here to worship the Trishul (trident) believed to be of Lord Shiva. A big fair is observed here on Baisakh Purnima night (a full moon night in May), every year. There was no temple so the Company constructed a temple. The new Bhaleshwor temple was consecrated on 24<sup>th</sup> Shrawan 2073, the local people about 10641 in number from chandragiri Municipality, Chitlang and Fhakhel municipality were invited to the place for the ceremony where the cable car service was provided free of cost for the day. This occasion indeed was one of the signification step to celebrate the ceremony and unity among the local people. Currently the newly built temple is considered as main pilgrim of the place and the plans formulated for the conservation of the traditional idols is yet to come into action.

#### 5.2. Historical Significance

Chandragiri hills carry historical significance as well. It was from this hills that King Prithivi Narayan Shah caught a the first glimpse of a much scenic and prosperous Kathmandu Valley, which in fact installed in king's mind an idea of annexing the valley into his kingdom.



Figure 15: King Prithivi Narayan Shah planning to takeover Kathmandu valley

According to folklore, Prithivi Narayan Shah is believed to have amassed spiritual power "sadhana" or meditation at these very hills. The Gorkhali king disguised himself while ascending the hills in order to avoid being recognized by the Malla kings of Kathmandu Valley. There is a saying that King Prithivi Narayan Shah made a wish to takeover Kathmandu valley was taken while he was in Chandragiri hills. As per the popular belief that it was the Bhaleshwor Mahadev that granted King Prithivi Narayan Shah's wishes. On the auspicious occasion of 295<sup>th</sup> Prithivi Janma Jayanti, the stone carving work that expresses the reflection of the event was installed.

Focusing on the chandragiri cable car project (CCCP), it is a profit oriented business invested by the private Sector. In the country like Nepal where with long term political instability, manpower draining off to abroad and insecurity in investment, need of the development is inevitable. In such scenario, huge investment from the private sector, at the organizational level, for the overall reinforcement of national economy through tourism has been appreciated all around. Nepal is very rich in terms of natural heritage and has high potential for economic growth through the development of tourism sector however it has been left behind due to the lack of promotion and investment opportunities. Now, with the availability of such environment where private sector can indeed invest has set an example by virtue of which such works could be done to uncover other natural and cultural heritages of the country.

The cable car's bottom station is being developed on 120 ropanis of property owned by Kathmandu Fun Park Ltd at Godam of Thankot. The 700 ropanis of land for the top station that lies on top of the Chandragiri hill has been taken on a 40-year lease from the government. The project was financed by a consortium of seven commercial banks of the country. Hemraj Dhakal of IME Group, Min Bahadur Gurung of Bhatbhateni Super Market, Paudel of Hathway Investment Company, Uttam Nepal of Uttam London Company, and Gyan Bahadur GC of Elite Capital are other members investing for the cable car and other projects. The total project cost of the CCCP is around Nrs. 3.25 billion, which was financed by 50 percent debt and 50 percent equity investment and 90 million has been invested to reconstruct Bhaleshwar temple. The payback period has been estimated to be in around seven to nine years. (Thapa, 2015). From the opening date to theof 24<sup>th</sup> Shrawan 2073 to the date, 25<sup>th</sup> Paush total 2,82,430 people have visited the place so far. (Chandragirihills, 2016)



Figure 16: Job opportunity in chandragiri Restaurant

Project's infrastructures like buildings and road were constructed by CE construction, Gauda Construction and scchhanda Construction. Hundreds of people were employed both on daily wages basis and monthly salary basis. After the complition of the other parallel projects, about 500 direct employment oppurtunity is estimated to be gererated. Similarly the locals from chandragiri municipality, Chitlang, and

Fakhel VDC are likely to be directly benefitted. (OnlineKhabar, 2016). With the project, the value of the land has been incressed and so are entrepreneurship and income generating oppurtunities around the vicinity of the Chandragiri project.

As per the general manager of the Chandragiri Hills Ltd., Chandragiri is aimed to be promoted as a tourist destination complete with facilities that meet international standards. (Bk, 2016) Similarly the projects are expected to attract Kathmanduites and other internal and external tourists to spend their holidays. However till the date it has been more popular as a destination for family outing. The information from the the news and social networking site, clearly indicates that the most appealing part of this project is cable car, natural beauty of the place, pilgrim ( for elderly people), the infrastructure and cleanliness of the place.



Figure 17: Chandragiri hills Ltd

With the available children park, hovering cartoon crews, and other entertainment commodities, the place seems to be designed for the domestic tourists rather than the external tourist.

Similarly, the other burning issue that has been constantly gloated all over the media ever since the opening of the place is the expensive price. With all the promotional activities, the tourist definitely come over the place but their consideration for revisit over the time and again is still doubtful. The plans has been formulated and worked upon to develop the site into an integrated



Figure 18: Resort under Construction

entertainment place by adding attractions like a boutique hotel, a mini-amusement park, rockclimbing, zip flying, paragliding, a 6D theatre and a botanical garden, as well as branded shops. This indeed is very important to restore the sustainability of the project. With the limitations in the inclusiveness of group with certain economic standard, the number of tourist visiting the place cannot be clearly stated thus in order to maintain the

upgrading inclination, several activities and strategies are need to maintain the dynamism of the place.

The project has also come up with various effective strategies that has indeed increased the number of tourist visiting the chandragiri. For instance, the project offers a 25 percent discount to students,

locals and elderly people above 60 years of age. Likewise, a 50 percent discount is offered to differently-abled people. No money is charged for a child less than 3 feet tall (Prasain, 2015)

Similarly for the devotees and tourists coming to the place the Ashok Leland's bus service with the capacity of 42 seats is provided free of cost. The buses are available every day at 7:30 am at the Bhatbateni of Koteshwor routes from the Koteshwor to Balkumari, Gwarko, Sathdobato, Ekantakuna, Balkhu, Kalanki and Chandragiri Similarly Maharajgunj route includes New Bus park, Balaju Bhatbhateni, Swyambhu Bhatbhateni, Kalanki and finally to Chandragiri. The tickets for



Figure 19: Free Bus Service

cable car is also available at the department store. Thus these kind of service to the consumer would definitely boost the number of tourists visiting the place.



On other hand Chandragiri Hills Ltd has announced new offer with heavy discount for the travelers by slashing the price of ticket to Rs. 108 for the month of Magh (Mid-January to Mid-February). However the discount only prevails every Monday of this month and first 108 people who purchase ticket will be get the offer. Similarly on the auspicious occasions like maghe sakranti musical, comical and other entertainment events were created over the place to

increase the number of tourist visiting the place.

Thus the overall progression slope of the project in terms of creating a platform where people would be enticed to come and spend their time and money is positive till the date. The program constitutes other several projects that are either in planning, constructing or implementing phase which indeed is very important to assure the sustainability of the project. Several attractive packages and all-economic-standard inclusive strategies or events could doubtlessly promote this area. Similarly with the programs that include the involvement and the socio-economic development of the local people would benefit both the people and the company in long term run. In other hand a part from the modern lustrous infrastructure that has been popular among the

general domestic tourist, more focus should be given to the historical and traditional essence of the place both for the sake of conservation and to increase the number of external tourists visiting the Chandragiri Hills.

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Field visit to Chandragiri Hills Pvt Ltd on 17 January 2017. The visit was participated by students, faculty members and CARD officials.