

## **SITE AND SITUATION IMPACTS ON THE GROWTH OF PROPOSED NEW BALAKOT TOWN, PAKISTAN**

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**Abstract:** The Earthquake–2005 completely destroyed the town of Balakot. The site of town has been declared as red zone and new town is proposed at Bakryal which is 22 and 15 km away from old Balakot town and Mansehra, respectively. The site analysis shows that this new town is well-planned and offering advanced utilities & services infrastructure with very low vulnerability to hazards. The site of the new town attracts the low income and public servant class of the of old Balakot town as well as the elite class of the region for residential purposes. However, economic, social and political interests of the business and landowners classes of the old town are feared to suffer. As a result, these groups of the Balakot community resist the process of resettlement. The residential plots are allotted to the residents of the old town. However, most of the residents are least interested in the new town. This situation encourages the real estate business in the new town. The site, situation and resettlement process differently affected the growth of proposed new town. The new town has huge capacity for growth and development. Initially, the property business and high level of non-basic activities and later on the favourable environment for basic activities will support the growth and development of this new town.

**Key Words:** Site & situation, resettlement, new township, urban growth, development.

### **Introduction**

The town of Balakot was completely destroyed by massive Earthquake–2005. The site of Balakot town has been declared as red zone (GOP, 2007a&b). As a result, the Government of Pakistan has decided to abandon the old Balakot town. A project of Rs. 12 billion (approximately US\$ 200 million) has been launched to rebuild a new modern Balakot town at Bakryal (APP, 2007). This site is 22 km south of the old Balakot town, and 15 km north of Mansehra (Fig. 1). A well-established plan for the new town at has been prepared by National Engineering Services Pakistan (NESPAK). The site has well planned infrastructure of

utilities and services. The site has also very low vulnerability to natural hazards particularly earthquake, landslides and floods. However, in the presence of major towns in the surroundings, it will be very difficult to flourish its own market and there are least opportunities of employment from manufacturing, agriculture, business and government sectors. This situation discourages the process of resettlement of town. The well planned site of the new town has huge potential of growth and for future expansion. The surroundings urban centres are in dire need of residential satellite town. The lack of interest of the residents of the old Balakot town in the new township for

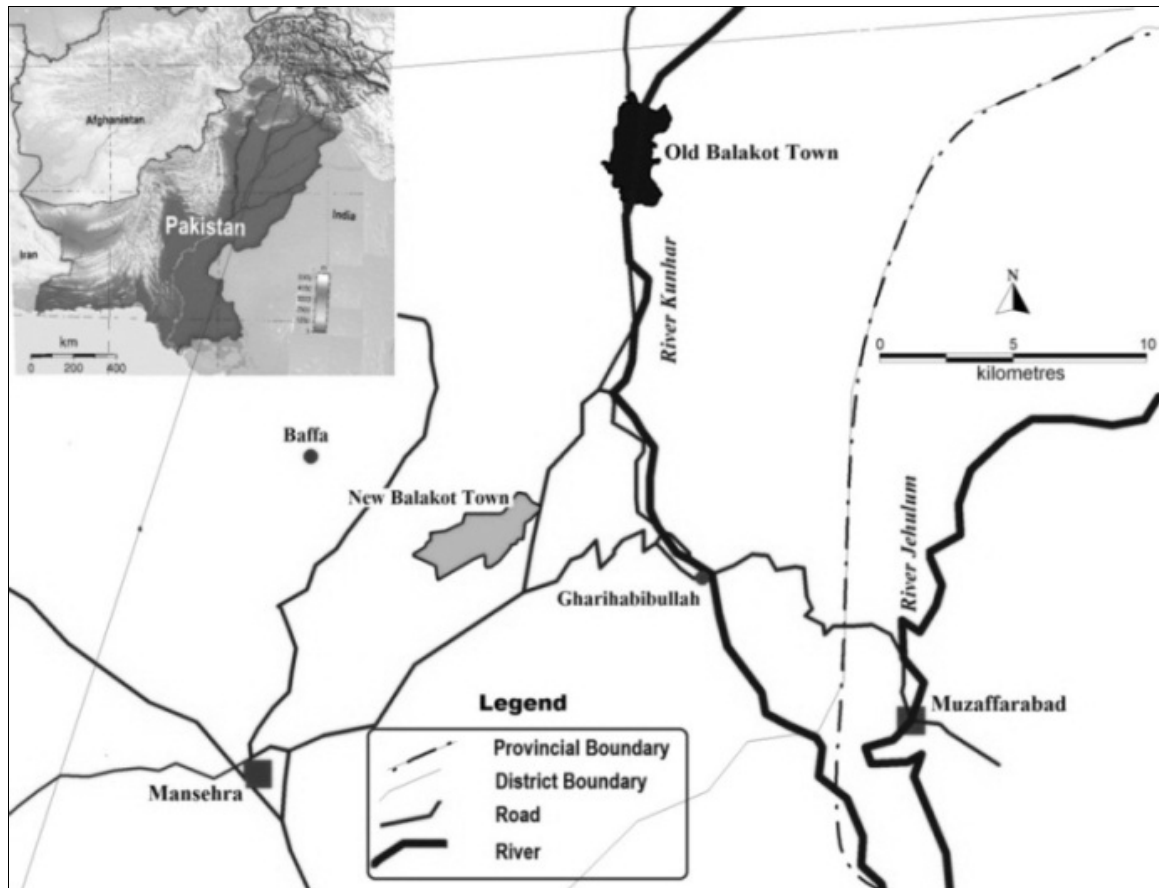


Fig.1. Location map of the study area

residential purposes will provide opportunities to the residents of the surrounding towns. Consequently, real estate

Resettlement is one of the most difficult risk reduction measures in disaster management. Worldwide, the process of resettlement has enormous problems and most often it exacerbates the hardships of affected community (Khan, 1992 & 1993 a & b). Particularly, post-disasters resettlements are always far behind the desired results. Turkey, Iran, Peru, Indonesia and many other countries led to unsuccessful stories of resettlement (Smith, 1991 and Norio *et al.*, 2003). The resettlement of the town is complicated and dynamic process. The Government has worked out a plan of

business will boost up in the area. This real estate business and high class of services would boom its growth and development.

resettlement of the town to mitigate the risk of earthquake hazard. The government authorities guided the resettlement processes through laws, regulations, incentives, and penalties. For successful resettlement of the Balakot, it is necessary that the residents of the old town shift to the new Balakot town. The new town provides high class residential and civic utilities & services. Comparatively, it has low business opportunities for the residents of the old town. As a result, the process of resettlement is adversely affected. This process of resettlement could be streamlined through change in policy and

enhancement of site and situation factors of the new town.

The present study explains the fundamental causes that attract the population for residential purposes and discourage business activities at the new town. The method of site and situation analysis provides a mechanism to understand the opportunities available for streamlining the process of resettlement and enhancing the growth & development of this new town. Similarly, it identifies the problems that create hurdles for the process of resettlement. The study has two parts. In first stage, the site and situation variables of the new town are analysed. In second part, these variables are analysed for the assessment of impact on the process of resettlement and potential growth of this new town. This study is an attempt to enhance the understanding of site and situation and its relationship with the growth of new town.

## **Material and Methods**

### ***Study Area***

The universe of the study is comprised of two areas of new and old Balakot towns. The new Balakot town is a proposed planned township at Bakeryal. The master plan is developed for the new town. The township area is demarcated and developmental activities have been started. After the Earthquake – 2005, the Government decided to abandon some areas for residential purposes based on fault lines and/or future seismic activities. This area is called red zone of the Balakot town. The red zone area of the Balakot town is a collective term for the area of five union councils i.e. Balakot, Garlat, Ghanool, Sathbani and Kewai. The Sathbani and Kewai union councils had less than 1 % share of the total population and area. These areas and households of these two union councils were

isolated from main Balakot town and most importantly, their residents could be easily resettled in other areas of these union councils. Balakot, Garlat and Ghanool union councils had more than 99 % of the total population and area share of the red zone.

### ***Research Methodology***

Research methodology has two major steps. In first step, the site and situation variables of the new town are analysed in post-Earthquake - 2005 scenario. In second step, the impacts of site and situation are interpreted with the process of resettlement and growth of the new town. The site analysis variables were selected from site factors of hazard vulnerability, water supply, slope aspect, natural resources, relief, geology, defence, building material (stone or wood), fertility of land, fuel supply, flat surface, accessibility, natural resources, etc. Similarly, the situation analysis variables were based on present and future potential of employment with particular reference to their basic and non-basic character. The potential growth of the proposed new Balakot town is assessed from site and situation analysis. The impact on process of resettlement is assessed through testing response of the residents of the Balakot against site and situation factors.

### ***Data Collection***

Primary data were collected in two different surveys. These surveys include field observations and questionnaire & focus group discussion (FGD). Questionnaire survey and FGDs were carried out with households, shopkeepers, offices, visitors and customers. In the red zone of Balakot there were 4244 households, in which 1050 households were surveyed from all 42 mohalla with 25.3 % of sample size from each mohalla. Similarly, there were 1500 shops, offices, banks, etc. in

the red zone area out of which 1437 shops were in the bazaar of Balakot town. Based on activities nature, 300 shops were surveyed from 21 different categories with 23.5 % of sample size. 100 respondents were surveyed from visitors and customers. The physical and economic aspects of the surrounding environment of the new Balakot town had been recorded through field observation survey. For this purpose, a systematic strategy for each variable of site and situation was adopted. In this survey, a base map of the study area, GPS tool, video camera and other necessary electronic accessories along with manual recording methods was used. In some variables, it was the sole method of data collection i.e. civic utilities & services, slope stability assessment etc. while in other variables it was supplemented by interview or focus group discussion.

Secondary data about physical environment, natural disaster vulnerability, population, land uses, land values, housing, water & sanitation, health, education, compensation, voter listing, transportation, non-governmental organizations (NGOs) activities and political administration were collected from census department, revenue and estate collector office Mansehra, District and Tehsil Nazim Offices, Town Committee, Union Councils, Earthquake Reconstruction and Rehabilitation Authority (ERRA), Provisional Earthquake Reconstruction and Rehabilitation Authority (PERRA), National Engineering Services Pakistan (NESPAK), Election Commission of Pakistan, Topographic Sheet, Google Earth's Data, Meteorological Department Of Pakistan, NGOs Offices, SUPARCO, Geological Survey of Pakistan, Sarhad Rural Support Programme, Internet and Research Publications.

### ***Data Analysis***

The primary and secondary data collected from field study and documents was analysed through cartographic, statistical and geospatial techniques. For this purpose, Macromedia Free Hand 10, SPSS 16 and Map-Info 10 were used. Database was created in SPSS and Map-Info 10 for site and situation variables and assessment of the response of residents of Balakot as well. The data of site and situation variables were interpreted through geospatial analysis. Similarly, the data of questionnaires were cross tab against each other of required variables.

## **Results and Discussion**

### ***Site of the New Balakot Town***

Site and situation of a settlement are the basic factors for the location and growth of a settlement. The study of site and situation provides the basic information for understanding the characteristics of a settlement. The terrain on which a settlement is to be built and over which it spreads is called site of the settlement. The major variables of the site are: relief, geology, water supply, nature of the river, hazard vulnerability, defence, building material (stone or wood), fertility of land, fuel supply, slope aspect, flat surface and natural resources etc. (Fig. 2) (Dickinson, 1948; Carter, 1988; and Geography field work, 2008). These variables provide the base for utilities & services and vulnerability to hazards in a developed settlement. The new Balakot town is proposed at Bakryal for the residents of old town. The site of the new town is located at a distance of 23 Km from the old town and just 11 Km away from Mansehra city (Fig. 3). After Earthquake – 2005, ERRA hired the services of NESPAK

for site selection and master plan development of new town. NESPAK identified 11 sites all in tehsil Balakot area for new town. Bakryal, the site for new Balakot town was selected purely on criteria of large area availability. NESPAK has carried out transportation, topography, reliefs, slope analysis, geotechnical, geological, environmental, and hydrological technical studies of the site of new town. After detailed studies and designing, the NESPAK developed a master plan for the new town.

The climate of the area is cold in winter and pleasantly warm in summer. The area has two distinct seasons; the summer season which lasts from April to September and winter season which expands from October to March. The mean maximum and minimum temperatures during the month of June are about 35 and 21°C, respectively. During the coldest month of January, the mean maximum and minimum temperatures are 14 and 2°C (GOP, 2010). The master plan consisted of area of 1,425 acres (11,400 *Kanals*) that will complete in two phases. Initially, the project compilation time was three years but due to land settlement issues, it was delayed. Presently, the developmental work is in progress. In new town, the total area has been divided into six major land uses. Almost 87 % area consisted of three major land uses i.e. residential, parks/greenery and roads/streets area (Table-1). The new town has been established with a vision that it will expand in three different directions i.e. south, east and west. It will have the capacity to house 2.5 million people in the next 25 years. The expansion areas available in these three different directions are 1600, 1400 and 1500 Hectares.

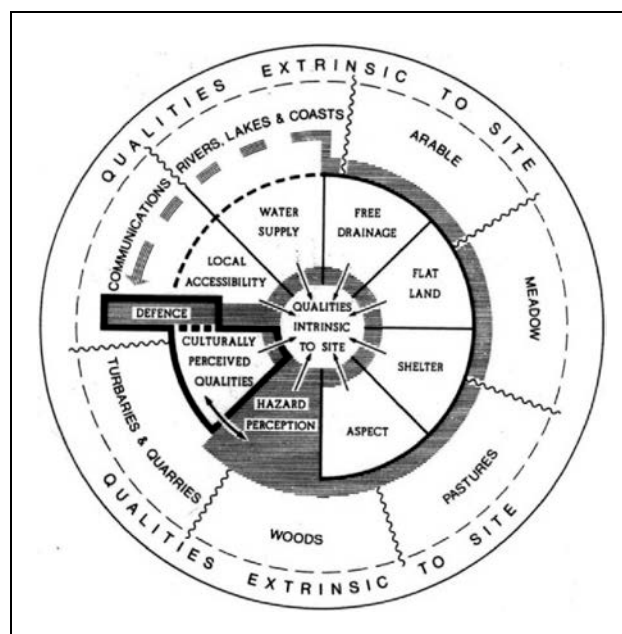


Fig.2. Site and situation of town

[Source: Roberts, K. 1987]

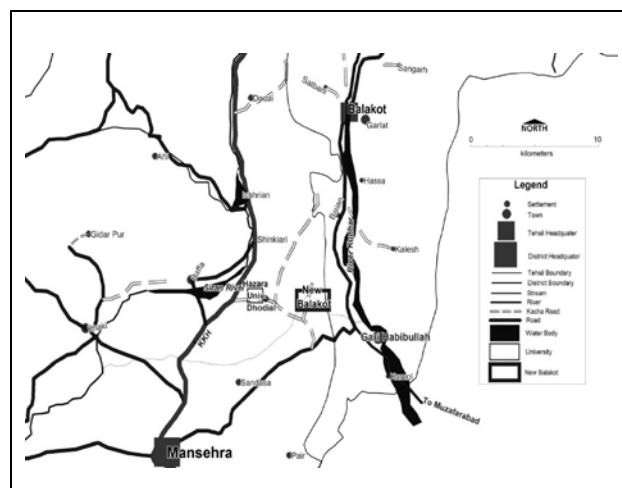


Fig.3. Location of the new Balakot town

In the master plan, accessibility (roads & streets) has the second largest portion of 31% of the total area while the greenery and parks on third with 23% of the total area. The parks & green areas consist of small public parks and green areas within commercial areas,

play grounds and preservation of forest as central park. The residential area has the largest portion of 33% of the total area. The residential area has been divided into three major categories of plot sizes with major share of 10 and 7 Marla plots (Table-2). The public buildings has the share of 7% of the total area. This 7% consist of educational institutions, health facilities and civic centres. The share of commercial land use is 4 % with the central, neighborhood and sub – neighborhood level facilities.

For drinking and household use, the new Balakot town has two water collecting sumps: first one in the south from river Siran tributaries and second one in eastern side from river Kunhar tributaries. Water from these sumps is to be transported to main water reservoir, comparatively at more height so that the whole town can be served. These water collecting sumps have limited capacity while their own surrounding needs and utilizations will increase with the passage of time. Hence, there is an ultimate plan of water supply to the new town from river Siran and river Kunhar. Contour (slope) based sewage treatment facilities has been proposed in the new town. Initially, the new town has two sewerage collection points with capacities of 1 and 1.25 million gallons per day (MGD). The ultimate sewerage treatment collecting points are in north western and south western sides with capacities of 4.5 MGD and 9.5 MGD, respectively.

The new town is located in a region where no major fault line is present and possesses a gentle slope. This site lies almost in between river Kunhar and river Siran. As compared to the old town, this new site is less vulnerable to earthquake, flash floods, landslides and fire hazards. The NESPAK carried out a detailed geological and seismological study of the site and regarded

this as very low vulnerability area for earthquake and landslides. Ensuring the building codes in construction of all buildings and stabilizing the slope and soil with proper planned roads and streets network further reduces the earthquake and landslide vulnerability. The new town lies in an area, which has very limited drainage area with gentle slope (Fig. 4). The gentle slope and proper drainage system has remarkably reduced the flash flood vulnerabilities. The fire hazards vulnerability is to be reduced with easy accessibility for emergency response and building material. Overall, the site of new town has very low hazards vulnerability as compared to the surrounding area and other urban centres in the region.

**Table1. Proposed land uses in new Balakot town**

S. No.	Land Use	Percentage Area
1	Residential	33
2	Commercial	4
3	Public Buildings	7
4	Parks/Green	23
5	Graveyard	2
6	Roads/Streets	31
<b>Total</b>		<b>100</b>

[Source: NESPAK, 2007]

**Table 2. Proposed residential plot sizes in new Balakot town**

S. No.	Plot Size	Frequency
1	7 Marla	1444
2	10 Marla	2052
3	20 Marla	504
<b>Total</b>		<b>4000</b>

[Source: NESPAK, 2007]

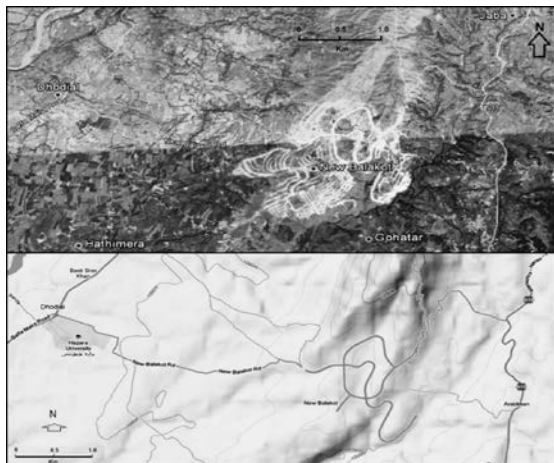


Fig. 4. Contour map of the new Balakot town [Source: Google Earth, 2013].

### ***Situation of the New Town***

The situation incorporates the surrounding physical, economic and cultural condition over a much wider area around the settlement. The situation factors control the functions of the settlement and thus controls the growth of that settlement. The situation is more dynamic as it changes over period of time significantly and may have physical, economic or cultural implication (Fig. 1) (Dickinson, 1948 and Geography fieldwork, 2008). The growth of a town is dependent on the relationship between primary and secondary occupations of townsfolk (Aurousseau, 1921). The cities develop in response to demands from other places (Mayer and Kohn, 1964). The function which brings money into the city is termed “basic.” In contrast, the second category (serving local demands) is termed “non-basic” and simply involves an exchange of money which basic efforts have already brought in (Jefferson, 1939). The Hoyt in 1939 developed the urban economic base concept. Economic base theory asserts that the means of strengthening and growing the local economy is to develop and enhance the basic sector. Almost all local services (like drycleaners, restaurants, and

drug stores) are identified as non-basic because they depend almost entirely on local factors (Klosterman, 1990 & 1993).

The situation of the new town is nodality and function of the town. The situation of the new town is measured in economic terms. The physical, economic or cultural implications change the situation rapidly. The surrounding physical, economic and cultural condition over a much wider area around the new town is determinant of the situation of new old town. The situation factors control the functions of the new Balakot town and thus control the growth of the town (Carter, 1988). To analyse the situation of new town, this section is divided into four major themes: basic activities, relative location, centrality of the new town and non-basic activities. The basic activities incorporate all those aspects of economic activities that support the growth of new town. Similarly, the study of non-basic activities of the new town provides the level of functions performed for the residents of the town. The interrelationship of basic and non-basic activities is carried out for future growth and current economic status of the town.

The basic activities in the new town can be divided into five major types i.e. administrative, political, social & cultural, commercial and manufacturing activities. The administrative and political activities will decide the fate of the new town. In case of higher order of these activities, higher would be its development and growth rate. The social and cultural activities would take time to flourish. In case of the new town, it will be very difficult to replace or replicate the old town. The present situation of the new town for commercial activities is not encouraging particularly in the presence of the commercial markets of Mansehra and Ghari Habibullah in

its near surrounding. For commercial activities, it has to be dependent on local market. Currently, the new town has no major manufacturing activities but its survival is linked with manufacturing sector.

The master plan of the new town mainly focused on residential activities with advance infrastructure facilities. These well-planned residential facilities are considered as growth pole magnet. To support its growth and development, the tehsil headquarter will be shifted to new town, which will also attract the political activities of the region to this new town. Initially, the nature of commercial activities will be non-basic and with the passage of time, the new town will support the market facility for all its surrounding areas. The manufacturing activities have very low share in proposed economic activities structure of the new town. However, it has very suitable environment for the manufacturing activities. The new town is planned on large area and its surrounding has agriculturally productive land, which will support its market activities in near future. The NESPAK proposed the structure of economic activities in which the tehsil headquarters function will be shifted to new town (Table-3).

The proposed new town is located at the south-western edge of the valley of river Kunhar. In the western part of the new town, a large portion is located outside of the tehsil Balakot boundary line. The link road to Karakorum Highway and Hazara University is under construction, which would increase its modality. The developmental work is under progress in the new town and infrastructure facilities like roads, streets, sewerage, sanitation, public buildings etc. are developing with encouraging speed. The new town has been planned for millions of population. The well-planned site and easy

accessibility for the residents of Hazara University, Mansehra and Ghari Habibullah towns make it very attractive as residential suburb town. The relative location and productive surrounding land of the new Balakot provide situation that support the growth and development of this new town. Similarly, the centrality analysis shows the dependency of the region on new Balakot town for higher functions that are performed by the town and ultimately support the growth and prosperity. However, it is uncertain whether or not it would replace or decrease the importance of the old Balakot town.

The new town is located in centre of major towns, which will directly restrict its trade and market capacity. However, the residential activities and productive land in surroundings will provide limited opportunities for market and trade activities. The administrative and political activities will further enhance the centrality of the new Balakot town. In term of commercial activities, it is very difficult to replace or replicate the old town. However, this new town has importance in regional or district perspective. Initially, the non-basic sector of commercial activities is very important as its number, variety and order (class hierarchy) will attract the residents. The residential plots or real estate business will be the far most important commercial activity, which will decide the future growth and development of this new town. The commercial activities are divided in neighbourhoods, which directly support the non-basic activities. The higher hierarchy of non-basic activities will attract the high-class residents of the district Mansehra and Hazara University. In long run, it will definitely attract customers from the region for these services.



**Table 3. Proposed economic activities in the new Balakot town**

S. No.	Type of Activity	Freq.	%age
1	Govt. Services	520	12.35
2	Industry	9	0.21
3	Livestock/farming	110	2.61
4	Private business	1432	34.02
5	Private service	281	6.68
6	Professionals	14	0.33
7	Trained labour	1156	27.46
8	Not mentioned	687	16.32
<b>Total</b>		<b>4209</b>	<b>100.00</b>

[Source: NESPAK, 2007]

### ***Growth of the New Town***

The new town has been planned with modern concepts of growth pole and green city. Before site selection and structural planning a detailed geological and seismic study was carried out to ensure low vulnerability to hazards. The standard of utilities and services in the new town will be the same as any modern towns in Pakistan. The site of Bakryal has huge expansion capacity with low seismic vulnerability. The contours are comparatively gentle so the landslide hazard vulnerability is very low. Most of the area has drainage towards river Siran (a tributary of river Indus). The new town has only one major issue and that is of water supply. The new Balakot town has central location for Mansehra town, Hazara University, Ghari Habibullah and the old Balakot town. This relative location makes the new town very attractive as a satellite town for residential purposes. The new town has been established with a vision that it will be expanded in three different directions i.e. south, east and west. It will have the capacity to house 2.5 million people in the next 25 years. The expansion areas available in these three different directions are 1600, 1400 and 1500 Hectares (NESPAK, 2010) (Fig. 5).

The site and situation variables are the prime factors for the establishment of new town and for its future growth and prosperity. The site of the new town is feasible for the present development and as well as for future growth and expansion. The site based standard civic utilities & services are the basic centripetal forces for its establishment and growth. The commercial activities are distributed in residential neighbourhoods. This infrastructure support non-basic activities. The situation of the new Balakot town is dependent on non-basic activities which mean limited business opportunities and lesser commercial land use. It will be difficult for landowners of agriculture and commercial land to manage their land from the new town. The business class is resisting the process of resettlement as their business interests will severely suffer. Similarly, the visitors/ customers have strong reservation on resettlement as their travelling costs will increase. This situation adversely affected the process of resettlement (Table - 4).

The high level of non-basic activities will enhance the attraction for the residence of elite class of the surrounding towns. The ownership of residential plot in the new town is certainly an economic opportunity. Initially, this opportunity will be availed by business class of the old town. The residents of the old town purse this situation as an opportunity for development. Almost, the whole community is ready to avail the residential plot in the new town (Table-5). As result, real estate business in the new town will be started. With the passage of time, the low income class of the town will not be able to bear the cost of services. This real estate business will enhance its growth and prosperity.

**Table 4. Management of property and business from new Balakot town**

Resident Address	Management of property from new Balakot town			
	Yes	No	Not sure	Total
Outside District Mansehra	12	1	1	14
District Mansehra	15	5	0	20
Valley	10	3	0	13
Balakot	46	339	5	390
Garlat	42	490	35	567
Ghanool	2	43	1	46
<b>Total</b>	<b>127</b>	<b>881</b>	<b>42</b>	<b>1050</b>
Resident Address	Management of business from new Balakot town			
	Yes	No	Not sure	Total
Outside District Mansehra	14	9	12	35
District Mansehra	12	7	14	33
Valley	1	15	16	32
Balakot	12	116	12	140
Garlat	10	39	6	55
Ghanool	0	5	0	5
<b>Total</b>	<b>49</b>	<b>191</b>	<b>60</b>	<b>300</b>
Resident Address	Management of visit/business in new Balakot town			
	Yes	No	Not sure	Total
Outside District Mansehra	0	0	10	10
District Mansehra	0	0	1	1
Valley	10	48	4	62
Balakot	1	9	0	10
Garlat	0	13	0	13
Ghanool	0	4	0	4
<b>Total</b>	<b>11</b>	<b>74</b>	<b>15</b>	<b>100</b>

[Source: Field Data, 2010]

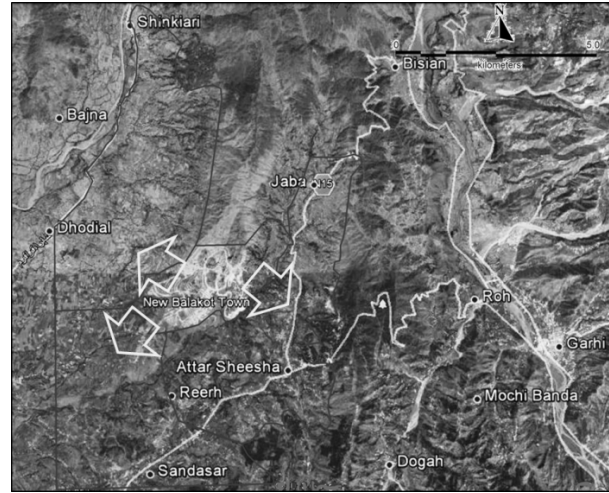
**Table 5. Willingness to avail the residential plot in the new Balakot town**

Response of Correspondence	Frequency	Percentage
Willing	3934	93.47
Not Willing	152	3.61
Indifferent	123	2.92
<b>Total</b>	<b>4209</b>	<b>100.00</b>

[Source: NESPAK, 2010]

The new town is located in centre of three major towns on a link road. Initially, this situation is not encouraging for market trade business. However, the new town has very favourable situation in the long run. It has very pleasant environmental and climatic conditions. The favourable situation factors are existed for establishment of restaurants and hotel businesses. These factors includes: the distinguished infrastructure of utilities & services in the region; central location for access to Karakorum Highway and tourists spots; pleasant weather conditions; market based demand for high class restaurants and hotels. Similarly, the new town and its surrounding have fertile soil, forests and well network of transportation facilities. These conditions are highly favourable for wool spinning industry, wood industry (furniture), paper mill, dry fruit and fisheries industries, match factory, soft drink industry, poultry and livestock farming. These activities are practiced in the surrounding regions with less favourable conditions. So there is a high probability that new Balakot town will provide a new nucleus for these activities. With the passage of time, it will develop its own market for its surrounding areas and gradually for whole region. The present situation is highly encouraging the high class residential activities which will play a vital role in growth and development of this new town. Eventually, the situation of the new Balakot town has the capacity to support the growth and development of a regional city.

Indeed, the new Balakot town will play a key role in the development of this mountainous region.



**Fig. 5. Proposed growth of the new Balakot town**

[Source: Google Earth, 2013]

## **Conclusion**

The new town was proposed for the residents of old town at Bakryal. This new town is well-planned with modern planning concept of green cities. This town has very low vulnerability to hazards and is facilitated with modern utilities & services infrastructure. The water supply facility is based on outside water collecting sumps in the new town. The new town is offering advanced and facilitated utilities & services infrastructure with very low vulnerability to hazards. These site factors made new town very attractive for residential purposes. It attract the low income and public servant class of the of old town as well as the elite class of the region particularly of Mansehra, Ghari Habibullah and Hazara University. Presently, the basic activities infrastructure in the new Balakot town is not encouraging. These situation factors of the new Balakot

town lead to undesirable situation for the process of resettlement. The residents of the old Balakot town are uncertain about the resettlement because the site is feasible while the situation is not encouraging in the new town. The business and landowners classes of the old town resist the process of resettlement as their current economic, social and political interests are likely to suffer due to shifting to the new town. For the residents of the old town, it is an opportunity in terms of economics, which they will avail in the same spirit. This new town has the capacity to grow with time but certainly not to cater the needs of the residents of the old town. It seems to be very difficult to replace or replicate the functions of old, particularly of commercial and social. The new town has very prospect future in the region as a modern green town. The high level of utilities & services; incomparable non-basic activities infrastructure; favourable environment for hoteling; and high potential for manufacturing sector will support the growth and development of this new town.

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