A comparative and spatial study of various areas of Khyber Pakhtunkhwa- an education perspective

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Abstract- Education is wisdom of skills, knowledge and learning which are transformed from one generation to the next generation subsequently. These skills, knowledge and learning are carried out in the educational institutes or universities through experts teaching professionals. The education system of Pakistan is divided into five basic levels which include: primary school, secondary school, higher secondary school, college, and university level. The basic aim of this study is to investigate the education perspective and comparison in different areas of Khyber Pakhtunkhwa (K.P.) for the students who are studying at the University of Peshawar. This study finds the ratio of male and female students who are currently enrolled in various departments of the university. This ratio is plotted in the map of Khyber Pakhtunkhwa. The proposed study highlights the comparison of the students' in undergraduate programme only.

1.   Introduction

The world population has been changing and growing continuously. It brings changes in each and every field of life. Education is one of them, which is wisdom of knowledge and skills. The countries which give a due value to the education sector so they should invest, the way they invest in the scientific research. Investing in education is the same as just investing in the future of a country. Comparative education define the similarities as well as differences between the educational systems (Bereday, 1964). Education in general while university education in particular, is essential for knowledge and society for all the nations. Higher education plays a key role in the growth of a society. For centuries, the universities perform a vital role in educating the social scholars, professionals, religious people, political leaders and the businessmen who work for the society, to develop and enrich its resources (Mustard, 1998).

Every nation tries to extend their self-consciousness by the process of quality education. The word education is usually considered as the academic, intellectual, logical, rational and moral training of the people by which their abilities and potentialities has been developed. All over the world, the quality of education is a significant issue, Pakistan is not an exception. Regarding economies and globalization, higher education have been more essential, particularly the quality education which is vital to the national development (including Pakistan). The main problem with all the developing countries is that they have given a very little priority to their higher education. A report of the World Bank (Bank, 2000) states that "without more and better higher education, developing countries will find it increasingly difficult to benefit from the global knowledge-based economy". At the time of independence, the condition of higher education was very tentative. That time Pakistan possesses only Punjab University (Khawaja, 1996). Latter on University of Peshawar has been come into existence in the year 1950, which in fact an honour for the whole Khyber Pakhtunkhwa province.

Unfortunately, Pakistan is still spending a very small amount of 2.7 percent of its Gross National Product (GNP) on education, while the United Nation Educational, Scientific, and Cultural Organization (UNESCO) recommended 4 percent for all the developing countries (Fukuda-Parr, 2002). Throughout the history, women possess only a very limited role in the society having limited opportunities. Education that nowadays has been accepted as a human right by various international conventions and a development imperative is one of the field that have suffered the issue of women. The preference over females by males in the sense of education has been an obvious feature since an ancient time in societies (Bokova, 2012). The practice

that has given shaped to the gender disparities in education sector almost all the countries. Education is acknowledged as a basic human right of males and females (Bokova, 2012). The contribution of men and women on a just equal basis is extremely important for the development of society. Education of women is necessary not only from the point of equal opportunity regarding education between both the sexes, but also for the extensive economic and social returns to the female education that can be attained by increasing the productivity of income level of women's, which are capable of producing better educated as well as healthy children, and at the same time reducing the fertility rates (Dundar & Haworth, 1993). The females who have improved education are better aware regarding the chances for themselves.

All over the world the quality of better education is quite important and Pakistan is one of them (Khan, 2013). Memon (Memon, 2007) pointed out the problems, issues, and challenges of education in Pakistan. Little reviewed the comparision of education for the duration of 20 years and investigate the similar study regarding the development studies and at the same time find out the future direction and the facing challenges for the comparative education system (Little, 2000). Iqbal carried out a qualitative study for the comparison of private and public secondary schools on various variables which includes management practices, leadership and physical facilities (Iqbal, June 2012). Suleman et al. explore and compare the online performance and certain secondary school teachers directly related to the teaching proficiency and the management of class room (Suleman, Aslam, Hussain, Ali, & Rehman, 2013). Anangisye et al. compare the education of Tanzania universities with African universities and the inspiration and expectations of the concerned students (Anangisye, Maarman, & Wolhuter, 2009). Saeed presented the comparison of six dimensions which includes education structure, supervision and management, teacher education and training, curriculum formulation, education and training authority, assessment and evaluation. The consequences show that the contradiction with these six dimensions, variation and similarity exist in the whole Pakistan (Saeed, 2007).

The present study is an attempt to show the total number of candidates applied to university of Peshawar for undergraduate programme and find out the ratio of male and female candidates at University of Peshawar from all the districts including Frontier Region (F.R.) as well as tribal (all Agencies) (Figure 2). Also an attempt is made to show these ratios in the map of K.P. University of Peshawar is known as the mother of all the universities in Khyber Pakhtunkhwa province that provides better quality education in the region. Since University of Peshawar plays a key role in the education sector of K.P. Therefore the students from all the areas are approaching to University of Peshawar for the purpose of education. Hence Peshawar University plays a very important role in term of education.

2.   Research questions of the present study
The research questions of the present study are:
- What are the total numbers of candidates applied to University of Peshawar for undergraduate programme in the session 2013?
- How to compare the different areas (including districts, F.R. and tribal areas) of Khyber Pakhtunkhwa from an education perspective?
- How to represent these areas geographically in the map of Khyber Pakhtunkhwa?

3.   Methodology
University of Peshawar is the mother University of Khyber Pakhtunkhwa, which aims "to love and to serve the entire creation of the creator". This institution is the most prestigious one among all the K.P. universities, and serves quality education from nursery to post doctorate. Hence due to this quality University of Peshawar is a unique institution in the region. Various programmes are offered in the university which includes 28 undergraduate, 40 postgraduate and 25 higher studies. The proposed study is applied to the students of undergraduate programme. Details of the given methodology regarding students from different areas in the University of Peshawar are presented below.

3.1   Total number of applicants applied
When an applicant applies to University of Peshawar, he/she has four options to apply for four different departments (if eligible). The following figure 1 visually displays the total number of applicants applied to the undergraduate programme in the mentioned university. The department of geology is the most dominant department in the figure having total number of 3196 applicants applied, while there is a fluctuation in the rest of the departments. The department of Art and Design is in the bottom list of the figure having total numbers of 42 candidates applied. The fluctuation in the number of applicants in the departments shows the interest of applicants in the relevant department.
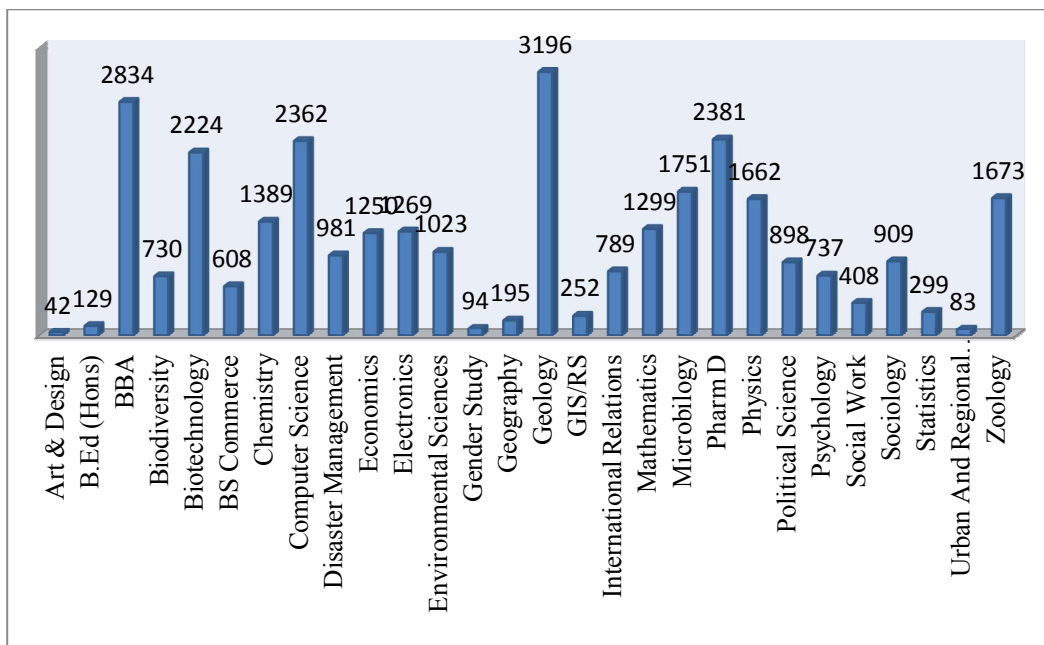
Figure 1. Graphical representation of total numbers of applicants applied to undergraduate programme in the University of Peshawar

3.2 Comparison of various areas of K.P. from education perspective

The following comparison has been carried out to show the statistics of the students (admitted) at the university. This is shown in various tables which emphasize the descriptive statistics, frequencies of male and female students.

Table 1. Districts wise male and female information

	Minimum	Maximum	Sum	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Male	1.00	299.00	889.00	27.7812	9.27076	52.44335	2.750E3
Female	0.00	260.00	514.00	16.0625	8.03557	45.45607	2.066E3

The following table 2 shows the descriptive statistics (Frequencies) for male students and showing the frequency of numbers, their percent, and cumulative percent.

Table 2. District wise data for male candidates

No. of candidates	Frequency\ No. of districts	Percent	Cumulative Percent
1	1	3.1	3.1
2	1	3.1	6.2
3	1	3.1	9.4
4	2	6.2	15.6
5	1	3.1	18.8
7	1	3.1	21.9
8	3	9.4	31.2
9	2	6.2	37.5
10	1	3.1	40.6
11	1	3.1	43.8
13	2	6.2	50.0
14	1	3.1	53.1
15	1	3.1	56.2
17	1	3.1	59.4
18	1	3.1	62.5
21	2	6.2	68.8
23	1	3.1	71.9
24	1	3.1	75.0
27	1	3.1	78.1
32	1	3.1	81.2
35	1	3.1	84.4
39	1	3.1	87.5
59	2	6.2	93.8
71	1	3.1	96.9
299	1	3.1	100.0
Total	32	100.0	

Table 3 shows the descriptive statistics (Frequencies) for female students and showing the frequency of numbers, their percent, and cumulative percent.

Table 3. District wise data for female candidates

No. of candidates	Frequency\ No. of districts	Percent	Cumulative Percent
0	5	15.6	15.6
1	3	9.4	25.0
2	1	3.1	28.1
3	3	9.4	37.5
4	2	6.2	43.8
5	3	9.4	53.1
7	4	12.5	65.6
8	2	6.2	71.9
10	2	6.2	78.1
17	1	3.1	81.2
21	1	3.1	84.4
27	1	3.1	87.5
28	1	3.1	90.6
29	1	3.1	93.8
31	1	3.1	96.9
260	1	3.1	100.0
Total	32	100.0	

The following figure 2 visually shows the ratio of male and female students at undergraduate programme at University of Peshawar.
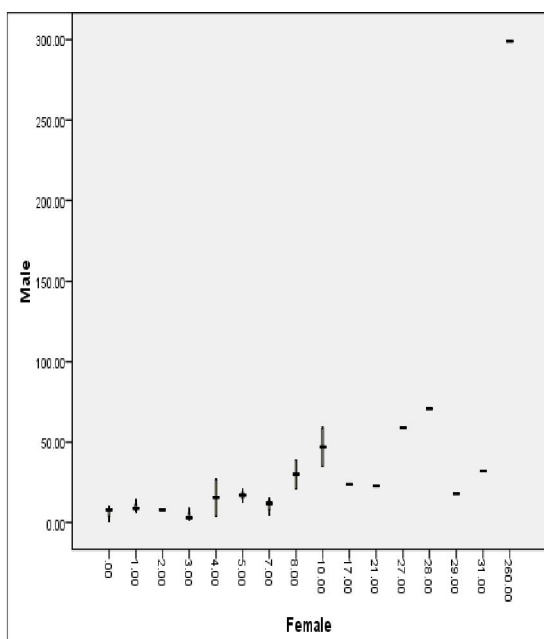

Figure 2. Male and Female ratio

3.3 Calculate odds ratio for the following division

The following tables (4-10b) show the odd ratio of the various division of K.P. Odds ratio is the measure of importance in statistics. The odds of success are defined to be the ratio of probability of highest p to the probability lowest q. Odds ratio is also called cross product ratio. If the result of the odds ratio is one, then it shows that the condition under study is likely equal in both the groups. If the odds ratio is greater than one, it indicates that the condition is less likely in the first group. The value odds ratio obtained must be greater or equal to zero. Mathematically the odds ratio can be expressed as (Iqbal, Nishi, Najma, & Sallahuddin, 2008):

$$\hat{\theta} = \frac{\hat{p}_1(1-\hat{p}_1)}{\hat{p}_0(1-\hat{p}_0)} = \frac{ad}{bc}$$

Table 4. Division wise Male and Female

Division	Male	Female
Bannu	30	12
Dera Ismail Khan (D.I.K.)	3	6
Hazara	21	13
Kohat	47	33
Malakand	153	48
Mardan	32	31
Peshawar	447	344

Table 5a. Odds ratio of male students for Peshawar and Bannu

	Gender		Total
Division	Male	Female	
Peshawar	447	344	791
Bannu	30	12	42
Total	477	356	833

Table 5b. Odds ratio of female students for Peshawar and Bannu

	Gender		Total
Division	Male	Female	
Peshawar	344	447	791
Bannu	12	30	42
Total	356	477	833

The result shows for table 5a, that the odds of male student in Peshawar are 0.52 times than Bannu (CI=0.262, 1.03 and $\chi2$=3.627; P=0.057) it means there is no association and for table 5b the odds of female students of Peshawar are 1.92 times than Bannu (CI=0.971, 3.813).

Table 6a: Odds ratio of female students for Peshawar and D.I.K

| Division | Gender | | Total |
	Male	Female	
Peshawar	447	344	791
D.I.K	3	6	9
Total	450	350	800

Table 6b: Odds ratio of female students for Peshawar and D.I.K.

| Division | Gender | | Total |
	Male	Female	
Peshawar	344	447	791
D.I.K.	6	3	9
Total	350	450	800

The result shows for table 6a, that the odds of male student in Peshawar are 2.59 times than D.I.K. (CI=0.645, 10.465; and $\chi2$=1.942; P=0.163) it means there is no association and for table 6b, the odds of female students of Peshawar are 0.385 times than D.I.K. (CI=0.096, 1.550).

Table 7a: Odds ratio of male students for Peshawar and Hazara

| Division | Gender | | Total |
	Male	Female	
Peshawar	447	344	791
Hazara	21	13	34
Total	468	357	825

Table 7b: Odds ratio of female students for Peshawar and Hazara

| Division | Gender | | Total |
	Male	Female	
Peshawar	344	447	791
Hazara	13	21	34
Total	357	468	825

The results of the odds ratio clearly demonstrates for table 7a, that the male student in Peshawar are 0.804 times than Hazara (CI=0.397, 1.629; and $\chi2$=0.367; P=0.545) it means there is no association and for table 7b the odds of female students of Peshawar is 1.243 times than Hazara (CI=0.614, 2.518).

Table 8a: Odds ratio of male students for Peshawar and Kohat

| Division | Gender | | Total |
	Male	Female	
Peshawar	447	344	791
Kohat	47	33	80
Total	494	377	871

Table 8b: Odds ratio of female students for Peshawar and Kohat

| Division | Gender | | Total |
	Male	Female	
Peshawar	344	447	791
Kohat	33	47	80
Total	377	494	871

The results of the odds ratio clearly demonstrates for table 8a, that the male student in Peshawar are 0.912 times than Kohat (CI=0.572, 1.455; and $\chi2$=0.148; P=0.7) it means there is no association and for table 8b the odds of female students of Peshawar is 1.096 times than Kohat (CI=0.687, 1.748).

Table 9a: Odds ratio of male students for Peshawar and Malakand

| Division | Gender | | Total |
	Male	Female	
Peshawar	447	344	791
Malakand	153	48	201
Total	600	392	992

Table 9b: Odds ratio of female students for Peshawar and Malakand

| Division | Gender | | Total |
	Male	Female	
Peshawar	344	447	791
Malakand	48	153	201
Total	392	600	992

The results of the odds ratio clearly demonstrates for table 9a, that the male student in Peshawar are 0.408 time than Malakand (CI=0.286, 0.58; and $\chi2$=68.259; P=0.000) it means there is some association and for table 9b the odds of female students of Peshawar is 2.453 times than Malakand (CI=1.723, 3.493).

Table 10a: Odds ratio of male students for Peshawar and Mardan

	Gender		Total
Division	Male	Female	
Peshawar	447	344	791
Mardan	32	31	63
Total	479	375	854

The results of the odds ratio clearly demonstrates for table 10a, that the male student in Peshawar are 1.259 times than Mardan (CI=0.753, 2.104; and $\chi2$=0.774; P=0.379) it means there is no association and for table 10b the odds of female

students of Peshawar is 0.794 times than Mardan (CI=0.475, 1.328).

Table 10b: Odds ratio of female students for Peshawar and Mardan

	Gender		Total
Division	Male	Female	
Peshawar	344	447	791
Mardan	31	32	63
Total	375	479	854

3.4 Geographical representation of K.P. Areas

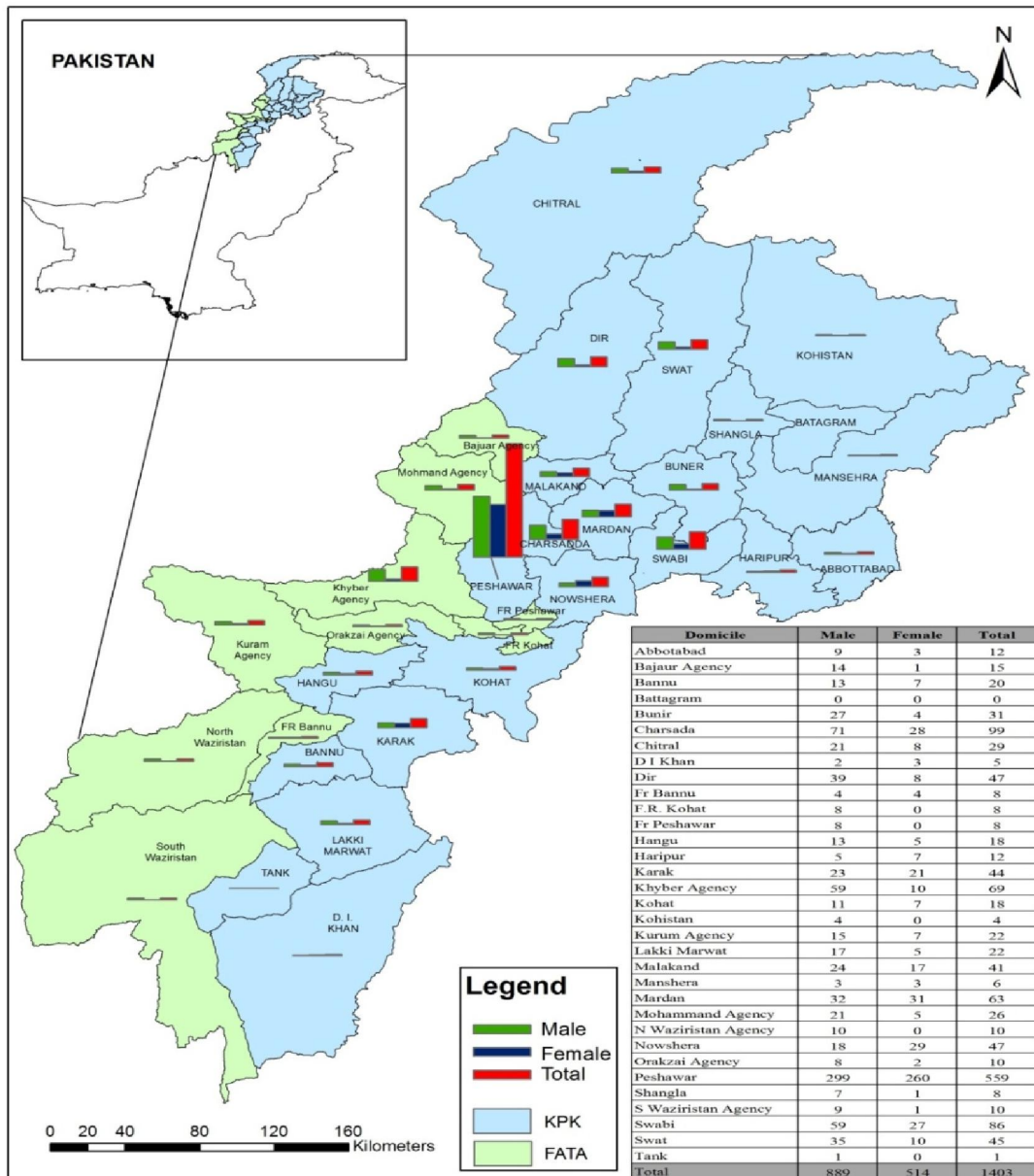| Domicile	Male	Female	Total
Abbotabad	9	3	12
Bajaur Agency	14	1	15
Bannu	13	7	20
Battagram	0	0	0
Bunir	27	4	31
Charsada	71	28	99
Chitral	21	8	29
D I Khan	2	3	5
Dir	39	8	47
Fr Bannu	4	4	8
F.R. Kohat	8	0	8
Fr Peshawar	8	0	8
Hangu	13	5	18
Haripur	5	7	12
Karak	23	21	44
Khyber Agency	59	10	69
Kohat	11	7	18
Kohistan	4	0	4
Kurum Agency	15	7	22
Lakki Marwat	17	5	22
Malakand	24	17	41
Manshera	3	3	6
Mardan	32	31	63
Mohammand Agency	21	5	26
N Waziristan Agency	10	0	10
Nowshera	18	29	47
Orakzai Agency	8	2	10
Peshawar	299	260	559
Shangla	7	1	8
S Waziristan Agency	9	1	10
Swabi	59	27	86
Swat	35	10	45
Tank	1	0	1
Total	889	514	1403

Figure 3. Representation of districts and tribal areas in the map of Khyber Pakhtunkhwa

The above map geographically represents the areas of K.P. including districts, frontier regions and the tribal area. Since the map of an area indicates the exact location of that particular area, because without map one cannot described these areas correctly. From the point of information, map is the best option because one can easily understand from the entire information at a glance. The following map represents the ratio between the male and female students. The given map has been designed by using Geographic Information System Software (ARC GIS).

In Figure 3 the georeference map of K.P. is given in which the light blue colour represent the entire districts including F.R regions while the light green colour shows the rest of the FATA. In the given map the green colour represent the male, blue for female and the red colour express the total number of the candidates, in which district Peshawar is on the top followed by Charsadda while there is a fluctuation in the rest of the districts. In the given map a legend, precise scale, true north for the direction is also given which are the essential of a good map. In the corner a complete table of the concern candidates has also been given which ultimately provide the additional information. In the last a map of Pakistan is also given for the exact reference of the K.P. map in which K.P. is clearly marked.

4.   Results and discussions

The present study highlights that most of the students in Peshawar University are from local areas i.e. Peshawar and Charsadda. The students from remote areas have been facing financial, transportation, and accommodation problems. The following figure depicts the percentage ratio among all the areas of K.P. province.
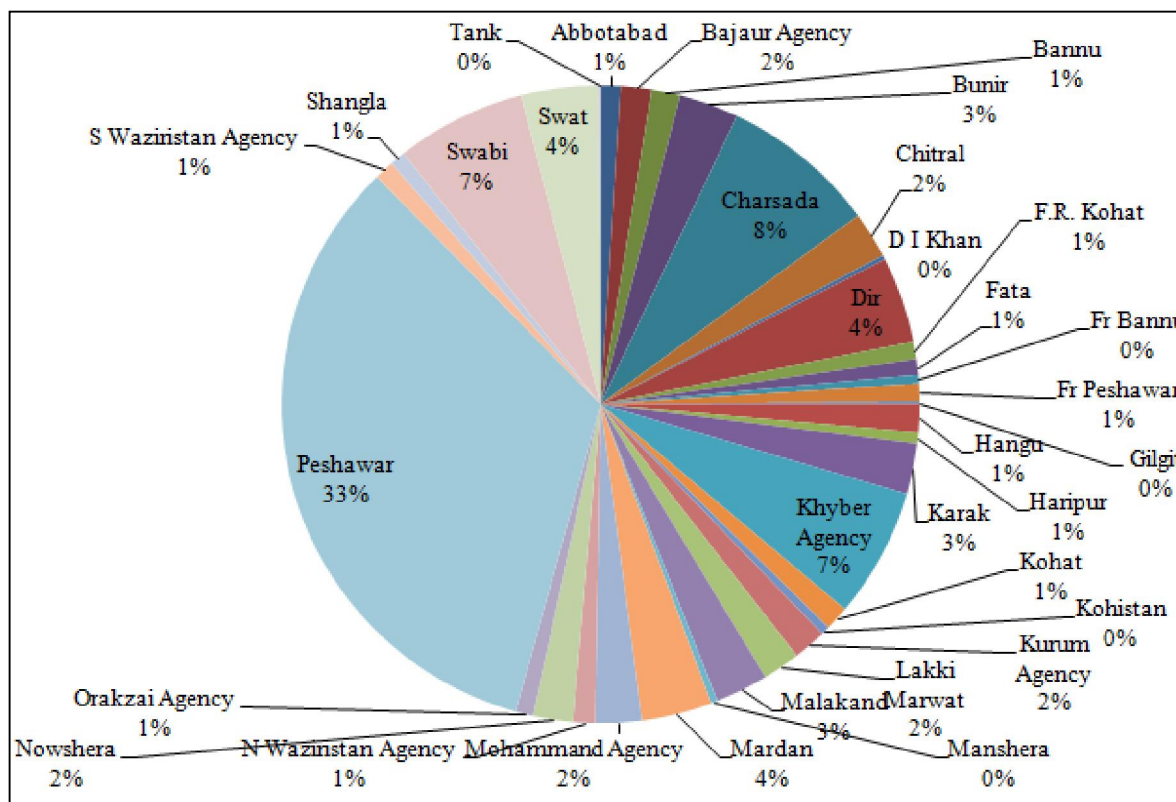

Figure 4. Percent wise representation of areas

5.   Conclusion

Most of the applicants/students from the different areas of the province are showing their interest to get admission in the top most university of the region. Among all these applicants, the most talented students are being selected at various programmes for admission in the university. The present study is an attempt to find out the numbers of candidates applied to undergraduate programme in the university, the students who are admitted in the University, and then the representation of these students (from various areas) in the map of Khyber Pakhtunkhwa. For all the analysis, various statistical tools and techniques have been used and the same then represented in the form of tables, maps and figures. Department of Geology is on the top in term

of admission fallowed by IM Studies (BBA) but fluctuation is found in the remaining departments. Finally we concluded from the entire study that most of the students have their tendency towards Geology as compared to the rest of the departments and at the same time we analyze that the bulk of students are from the areas which are located in the proximity of the Peshawar University.

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