



Research Article

Adverse Effects of Urban Sprawl on Agricultural Production in Rural Area of District Peshawar

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Abstract | The present study titled adverse effects of urban sprawl on Agricultural production was conducted in rural areas of District Peshawar. The major focus of the study was to investigate the adverse effects of urban sprawl on agricultural production. Four villages were randomly selected such as Qazi Killi, Tarnab, Mughdar Zai and Musa Zai. The total households' number was 10496. A sample size of 385 was drawn out of total households through Yamani formula. Proportional allocation method was used for equal representation of the respondents. Interview schedule was used as a tool for the collection of primary data. The data results indicates that majority of the respondents were having age between 20-30 years. The illiteracy ratio was 58% while 42% were literate, 28% of the respondents were having primary level of education. The family size was above 5 members. Nineteen percent respondents were involved in agriculture activities and 81% number of respondents were involved their business. Only 19% of the respondents were having own land in which 17% of the respondents holding land was 5 Kanals and only 2% of the respondent's land holding was more than 5 Kanals. Owner cultivator was 13%, Owner-Cum-tenant was 4% and tenant cultivation was 2%. The agricultural land was sold for multiple purposes, such as for houses construction, children education, and small business and to purchase plots in city due to which agricultural land was decreased. Urban sprawl association with agriculture declining was found highly significant at .01 confidence level. A highly significant association ($P=0.000$) was disclosed between urban sprawl and decreasing of agricultural land. Likewise, a significant association ($P=0.000$) was found between industrial expansion. Similarly Parks construction, high population growth, rural-urban migration, lack of proper planning of the city, lack of vertical building management have decreased the agricultural production of the study area. The agriculture land was decreased due to construction of road, houses, park and industries in the study area. T-test was used and the result shows that the land holding mean of the respondents 2023 was 1.9682 Kanal while 1998 was 2.6409 Kanal, the difference was 0.67273 Kanal, the percent change was -25.48 while the degree of freedom was 384 and p value was .000., So it shows that the result is highly significant at .01 confidence level. It explains that the mean land before was more while due to urban sprawl it decreased from 2.6409 to 1.9682 Kanal averagely. On the basis of problems the study recommend that to make proper law for urbanization in the Country; Provide subsidy and support price to the rural farmer for enhancing agriculture production for high return *etc.*

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Introduction

Urban sprawl is a process through which the surrounding area of the city expands to building which has occupies the agriculture land while decreased the agricultural production. Now a day urban sprawl is the serious issue and problem of the world. Literature shows that urbanization is mostly due to population growth, people migration from rural areas to urban areas for basic needs of daily life. Urbanization has advantages as well as disadvantages, in shape of increasing basic facilities, namely electricity, school colleges and hospital in the area which attract the rural people to urban area and increased the population density of the city and made the area most polluted. Urbanization has disturbed the green belt and damaged the ecosystem of the area of District Peshawar. It has also increased the price of the land which pay more amounts to community of District Peshawar while it boosts non-agriculture activities in the study area. Agricultural production is necessary for survival of life and without agricultural production the survival of life is impossible. Due to large scale construction, agricultural land has been occupied by building in Peshawar district, which converted agricultural land into non-agricultural activities and declined the agricultural production.

Land degradation (LD) is a universal issue and age, household size and farming experience have positive relationship with the land degradation. Through search it was found that the land degradation is very serious due to soil erosion, soil fertility loss, overgrazing, over population growth, soil salinization, tillage erosion, poor land management practices and water degradation. Land degradation have, increased the necessity for fertilizers, loss in livestock production, migration, poverty and economic backwardness in the study area. High land degradation has negative association with the socio-economic condition. Land degradation has destroyed the land which has decreased the agricultural production and low agriculture has created the food crisis not only in the study area but also in the world (Ullah *et al.*, 2019).

Agricultural land was decreased 9% in the past in two decades. The results show that the age, income, land ownership, farm inheritance by successors, social networks and lack of basic facilities are factors for selling the agriculture land. However, due to low return from agriculture is also the main reason for agricultural

land selling. The agricultural activity gives less benefit to the farmer, So, they sell the land of agriculture and start other non-agriculture activities which give more return to them. So, it is the responsibility of the government to give prior price policy to farmers to encourage them in the cultivation of crops in the long run (Rajpar *et al.*, 2019).

Urbanization is a process of regional and national development. It provides job and increase the economic growth of the country. On the other side urbanization is the transformation of the society. Through urbanization the society change from traditional to modern one. It enhances GDP of the country which is a good sign of prosperity and development. On the other hand urbanization decreased the agricultural land and agricultural production which create the problems of food for the nation. Urbanization is also responsible for pollution, over-crowding, increasing ratio of crimes, dacoits and disturbance the ecosystem of the area (Khan, 2017). Low-productivity of lands has positive effect on the urbanization. Due to low productivity, the landowners sell the land on high price to housing societies (Coulibaly and Li, 2020)

Most of the paddy fields were converted for home and housing, partially used for economic activities that have higher land rent such as shops, boarding houses, and restaurants. The perceived impact is increasing air temperature, air pollution, also reduced employment opportunities and income from agricultural sector (Fandani and Harini, 2020). The total population of Hyderabad district has increased by 44% in the last 36 years (from 1981 to 2017). Seventy percent of the agricultural land in Hyderabad district has been sold and converted to construction of buildings. This has led to the shortage of food in the city and damaged the ecosystem of Hyderabad District (Moula *et al.*, 2019). Samiullah *et al* (2018) investigated that land holding play great role in the development of a country while in Peshawar District year by year the land is fragmented into parts through inheritance and become small and small which affect the agriculture production of district Peshawar. Generally Pakistan and particularly District Peshawar agricultural land were mostly converted to house building and road by building societies which have polluted the environment of the Peshawar city but also destroyed the rural area of District Peshawar. Seeing to its importance the present study was arranged to investigate the adverse effects of urban sprawl on agricultural produc-

tion in rural area of district Peshawar.

Materials and Methods

This section divides into five parts such as namely universe of the study, sampling procedure, data collection tools, data analysis and conceptual frame work. The universe of the study is District Peshawar. The total area is 1257 Sq km. Its total population according to census of 2017 is 4269079. The population is further divided into males and females. The male’s population is 2201257 and female is 2067591. The area is divided into rural and urban. The rural population is 2299037 and the urban is 1970042 while the total household number of district Peshawar is 489843, rural is 253787 while the urban household is 236056. The total village councils in district Peshawar are 227, village council number is 216 and neighborhood council number is 11. There urbanization process is on the top and have constructed many building on the ring road which have occupied agricultural land of the district. In rural area farmers cultivate their land and grow different crops and vegetable in the area. District Peshawar is consisting of four towns. District Peshawar is consisted of four towns. Due to financial and time constraint from each town one village namely Qazi Killi, Tarnab, Palosi Maghdazi, and Musa Zai were respectively randomly selected. The total household in Qazi Kili is 4316, Tarnab 2212, Palosi Maghdazi 1761 and Musa Zai 2207. The total household number is 10496 in four villages. Yamani Formula was used and the sample size was fixed to 385. Then through allocation proportion method 385 were distributed among the selected villages while lottery method was used for respondents’ selection in each village. The detail is given below in Table 1.

Table 1: Sample distribution in four villages of the study area.

Name of town	Name of village	Household number	Sample size
Town-I	Qazi Killi	4316	158
Town-II	Tarnab	2212	81
Town-III	Palusi Maghdazi	1761	65
Town-IV	Musa Zai	2207	81
Total		10496	385

Sources: Local Government Census 2017

The data has two types’ namely secondary and primary data. Secondary data was collected from the

published literature while primary data was collected from the selected respondents with the help of interview schedules. The collected data was edited and then it was entered into the computer. After entering in the computer then the said data was analyzed. Univariate and Bi-Variate, descriptive statistics, chi square and t-test were used for data analysis There are two types of conceptual framework of the study, namely theoretical and conceptual framework. The theoretical frame work is linked with the theories of the past while conceptual framework is linked with the researcher mind, what he says about the present situation of the study which he saw in the field practically.

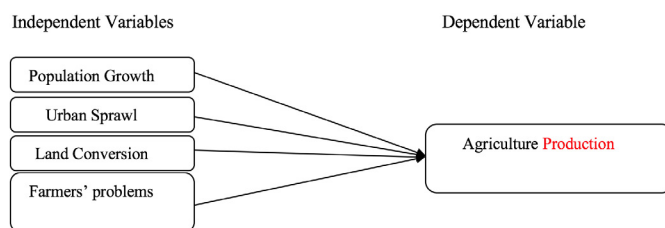


Figure 1: Conceptual framework of the study.

Results and Discussion

This section discusses the result after data analysis. The main focus of the study was to find out local perception about urban sprawl effects on agriculture production in District Peshawar. It initially explains the personal and demographic characteristics of the sampled respondents are followed by Uni-variate analysis of the data. Table 2 indicates Age, Literacy, Education level and Family type wise distribution of the sampled respondents in the study area

Age of the sampled respondents

Age is a factor which affects the development of the country. Different age experiences affect the economic growth at different level. So age stages play important role in the development of a country. Table shows age wise distribution of the sampled respondents in the study area. According to table 36% of the respondents belonged to the age category of (20-30) year, 18 % respondents belonged to (30-40) years, 16 % of the respondents belonged to (40-50) years. Similarly, 9 percent respondents fall in the age category of (50---60) years and 21 % falls in the age category of above 60 years. Madsen *et al.* (2010) told that now a day the world has 3.6 billion people under age 30 which play great role in security and governance challenges in the

world. Similarly in the study area under age 30 the number is more than the other categories when we compare with the online study, so age play great role in the development of a country.

Literacy status of the sampled respondents

A person is considered literate when he can read or write a sentence in Pakistani society. Literacy is a tool for development of a nation and country. Table shows the literacy status of the sampled respondents in the study area. According to table the illiterate percent number is 58 while the literate is 42. This shows that majority respondents in the study area are illiterate. They cannot read and write. The Pakistan literacy rate is 60 percent however the project area literacy level is below the Pakistan literacy rate. Therefore, it is necessary for the government to improve the literacy rate of the study area as like developed countries of the world. Khan et al. (2019) argued that the China, America, Japan, France literacy rate is higher than Pakistan and this is the reason that the Pakistan economic growth is very low than the developed countries of the world because literacy play great role in the development of a world. The literacy level of the project area is very low when compared with the literacy level of the developed countries of the world, so this is the reason how they planned for future.

Education level of the sampled respondents

Education level of the people of a country plays important role in the development. There are three main types of education in Pakistan such as, formal, non-formal and informal education. Table indicates education level wise distribution of the sampled respondents in the study area. According to table, the number of primary level of education was 28 percent, Middle 25 percent, Matric 15 percent, Intermediate level is 13 percent and BA and B.sc level respondents percent were 19 percent. The level of primary level of education was higher than others which is followed by middle level education. The intermediate level is lowest among all education level while it is followed by Matric level of education. Coulibaly and Li (2020) highlighted from their findings that education level has a significant contribution in the annual income of the family. Educated members of family know better the exploitation of the resources.

Family type of the sampled respondents

There are three main types of family system which existed in Pakistani society namely nuclear, joint, and

extended family. Table indicates the family type's wise distribution of the sampled respondents in the study area. According to table, nuclear family number is 8 percent while joint family system comprised of 91% and the extended family percentage is only 1 percent. Majority of the respondents come in the joint family which is followed by nuclear family. The lowest number is in the extended family type. The table data shows that joint family is still strong in the study area. Jacob et al. (2022) discussed that in Sub-Sahara Africa in Ghana nuclear family is common due to which the number of houses increased in the area which in turn led to urban sprawl in the shape of decreased agricultural land.

Table 2: Age, literacy, education level and family type wise distribution of the sampled respondents in the study area.

i. Age wise distribution of the sampled respondent in the study area		
Age wise category (Years)	Frequency	Percent
20-30	141	36
30—40	73	18
40---50	62	16
50.---60	30	9
Above 60 Years	79	21
Total	385	100
ii. Literacy Status wise distribution of the sampled respondents in the study area		
Particular item	Frequency	Percent
Illiterate	225	58
Literate	160	42
Total	385	100
iii. Education level wise distribution of the sampled respondents in the study area		
Education level	Frequency	Percent
Primary	44	28
Middle	40	25
Matric	24	15
Intermediate	21	13
BA/B.Sc.	31	19
Total	160	100
iv. Family types wise distribution of the sampled respondents in the study area		
Types of family	Frequency	Percent
Nuclear	30	8
Joint	352	91
Extended Family	3	01
Total	385	100

Source: Field Survey 2023

Table 3: Land tenure status, agriculture land holding, annual agriculture farming income and annual business income wise distribution of the sampled respondents in the study area.

i. Land tenure status wise distribution of the sampled respondents in the study area		
Tenure status category	Frequency	Percent
Non-Agriculture	312	81
Owner Cultivator	051	13
Owner Cum-Tenant	016	04
Tenant	006	02
Total	385	100
ii. Agriculture landholding distribution of the sampled respondents in the study		
Agriculture land wise category	Frequency	Percent
No Agriculture Land	312	81
Below 1 Kanal	06	02
2 Kanal	42	11
3 Kanal	13	03
4 Kanal	04	01
5 Kanal	04	01
Above 5 Kanal	04	01
Total	385	100
iii. Agriculture farming income wise distribution of the sampled respondents in the study area		
Income wise category	Frequency	Percent
No Income	312	81
Rs.10000-Rs.15000	8	02
Rs.15000.--Rs.20000	25	06
Rs.20000.--Rs.25000	4	01
Rs.25000.---Rs.30000	18	05
Rs.30000.---Rs.35000	4	01
Above-Rs—35000	14	04
Total	385	100
iv. Annual businesses income distribution of the sampled respondents in the study area		
Business income wise category	Frequency	Percent
Below Rs.100000	21	5
Rs.100001-Rs.200000	24	6
Rs.200001.-----Rs.300000	56	16
Rs.300001----400000	67	17
Rs.400001-----Rs.500000	53	14
Rs.500001----Rs.600000	66	17
Above Rs.600000	98	25
Total	385	100

Source: Field Survey 2023

Land tenure status of agriculture land of the sampled respondents

Table 3 indicates the land tenure status wise distribution of the sampled respondents in the study area. Eighty one percent of the respondents have no land in the study area. Owner cultivator is comprised of 13% of the respondents, followed by Owner-Cum-Tenant which comprised 4 percent of the respondents and only 2% of the respondents are tenant in the study area. Joseph et al. (2022) argued that land tenure play great role in the development of agriculture. The owner cultivator has good access to credit and they get the credit easily from the bank for input purchasing to their crops and because of this they get more production than the tenant cultivator. Similarly, the owner cultivator has great number than the tenant while due to urban sprawl more land have been occupied by building in the study area.

Agriculture landholding of the sampled respondents

Due to city expansion the landholding of the sampled respondents were decreased and now it come into Canals in the study area. Table 3 indicates that 81% of the respondents have no land. 2% of the respondents have one canal land, 11% of the respondents have two canals land, 3% of the respondents have three canals land, only, 01% of the respondents have four canals land and the remaining 01% of the respondents have five and above five canals lands. It was concluded from the data that land possession was decreased after urban sprawl in the study area. Urban sprawl increased the prices of land and people sold their land in order to start small business to increase the income.

Ali et al. (2019) analysis explored that the cultivated area was reduced from 146 square kilometer to 91 square kilometers due to loss of land from 55 square kilometer area between the times of 1986 to 2015 in rapid construction. The annual reduction of land lose was 1.6 square kilometers. There will be no land in Peshawar till 2055 due to sharp decrease of land.

Annual agriculture farming income of the sampled respondents

Income of the family plays important role in the socialization process of its members. Table reveals annual agriculture farming income wise distribution of the sampled respondents of the study area. According to table 81% respondents have no income from agriculture land. Only 19% respondents have income from agriculture sector. According to table 2% fall in

income category Rs.10000-Rs.15000 while 6% fall in income category Rs.15000.--Rs.20000. Similarly 1% respondents come under income category Rs.20000.-Rs.25000 and 5% respondents fall in income category Rs.25000.---Rs.30000 while 1% respondents come under category Rs.30000.---Rs.35000 however 4% come under category Above-Rs—35000. The highest respondents were found in income category Rs.15000.--Rs.20000 which is followed by income category Rs.25000.---Rs.30000. The lowest income category respondents was Rs.20000.--Rs.25000 and Rs.30000.---Rs.35000 which is followed by income category Rs.10000-Rs.15000. The table indicates that people of the area are taking less interest in farming due to involvement in other small business. As we know that maximum agricultural land was occupied by building in the study area.

Meijerink and Roza (2007) reported that agriculture play great role in the development of a country not only for food crisis solution but also generating in employments and environmental cleaning. It provides oxygen to the world for respiration and without oxygen the survival of life in this world is impossible, so if the urbanization process convert the agriculture land to building. Through this way food will be affected which in the long run make the environment unfavorable. Such type urban sprawling activities in the study area not only affect the food but also make the environment negatively. Such type situation is also existed in Peshawar District.

Annual Business Income of the Sampled Respondents

Table shows the annual business income wise distribution of the sampled respondents in the study area. In the study area majority people depend on business income which mostly link with their education, income and health. According to table in income category Below Rs.100000 the respondents' number is 5%, while in income category Rs.100001-Rs.200000 the respondents' number is 6%. Similarly in income category Rs.200001.-----Rs.300000 the respondents number is 16% while in income category Rs.300001---400000, the respondents number is 17% and in income category Rs.400001-----Rs.500000 the respondents number is 14% however in income category Rs.500001----Rs.600000 the respondents number is 17% but in income category Above Rs.600000 the respondents number is 25%. The highest respondents number was found in income category above Rs.600000 which is followed by income categories

Rs.300001----400000 and Rs.500001----Rs.600000. The discussion concludes that the income in business category was more than the agriculture category because agricultural activities give less return to respondents than the business. Therefore they turn to business activities to city for high return which put pressure on the city area. Darin et al. (2017) study revealed that income play great role in socioeconomic uplifting and agriculture development while through business more income is earned by respondents which mostly link with their social activities. They make the house with the help of this income. The same situation is also existed in District Peshawar.

Urban sprawl effects on cropping pattern of the sampled respondents

Table 4 reveals perception regarding urban sprawl effects on cropping pattern of the sampled respondents in the study area. About 87 percent of the respondents favored about the effects while 7 percent of the respondents were against the effects and remaining 6 percent were uncertain. Yousaf et al. (2018) investigated that urban sprawl has affected the cropping pattern of the study area. It has decreased the fertility of the land and affects negatively the production of the TERESA District in Egypt. Similar condition is also existed in District Peshawar. Huge area of agriculture were converted into building which degraded the agriculture land and directly decrease the production level of the crop and affect the cropping pattern of the study area.

Table 4: Perception regarding urban sprawl effects on cropping pattern of the sampled respondents in the study area.

Particular Item	Frequency	Percent
Yes	336	87
No	028	07
Un-Certain	021	06
Total	385	100

Source: Field Survey 2023

Urban sprawl effects on agriculture production declining of the sampled respondents

Different factors affect the agriculture production negatively while urban sprawl also affects the agriculture production negatively. Table 5 shows perception regarding urban sprawl effects on agriculture production declining of the sampled respondents in the study area According to Table, 91 percent respond-

ent told that urban sprawl has effect on agriculture production declining while 5 percent say no and the 4 percent were found uncertain. It shows that urban sprawl affect the agriculture production negatively in the rural area. Due to urban sprawl different problems were faced by people in the city which pollute the irrigation channel of the rural area and decrease the agriculture production of the rural farmer of the study area. So urban sprawl mostly affects the agriculture production negatively and affects the income level of the rural farmer.

Malik and Ali (2015) told that both agriculture value added % of GDP and agricultural value added annual % of growth had a negative relationship with the urban population, it means that as the urbanization rises more and more agricultural land is converted to non-agricultural uses which lead to the reduction of agricultural production. The result shows the urgent attention of the policy makers towards the policy implication for the land management to prevent further agricultural land loss. Similar situation is also existed in the study area. Slowly gradually the urban sprawl occupy the agriculture land for building construction which further decrease the production of agriculture in the study area.

Table 5: Perception regarding urban sprawl effects on agriculture production declining of the sampled respondents in the study area.

Particular item	Frequency	Percent
Yes	350	91
No	019	05
Un-certain	016	04
Total	385	100
Total	385	100

Source: Field Survey 2023

Bi-variate analysis

Bi-Variate analysis was used to investigate the association between independent Variables (City Expansion, House Construction, Shop Construction, Road Construction, Educational institution Construction, Hospital Expansion, Industry Expansion and Park Construction) and Dependent Variable (Agriculture Production). Through cross tabulation Chi Square was estimated and discussed with suitable reasons (Table 6). Association between Different Independent Variables and Agriculture Production Declining

of the Sampled Respondents

Association is the link between two variables which may be positive and negative in the field. Table 6 reveals the association between different independent variables and agriculture production declining of the sampled respondents in the study area.

Table shows that there is a significant association (P=0.000) was found between city expansion and decrease in agricultural production at the confidence level of 0.05. Similarly, a significant association (P=0.000) was disclosed between construction of houses and decrease in agricultural production. Construction of houses led to decrease in agricultural land which in turn decreased agricultural production in the area. In contrast to above, a non-significant association (P=0.954) was found between construction of shops and decrease in agricultural production. A positive relationship (P=0.000) was found between roads construction and decreased agricultural production at confidence level of 0.01. Furthermore, a positive relationship (P=0.000) was found between construction of universities and decrease in agriculture production. A non-significant association as indicated by (P=0.09) was found between hospitals construction and decrease in agriculture production in the study area.

A significant relationship (P=0.000) was disclosed between industry expansion and decrease in agricultural production with confidence level of 0.01. Also, a significant association was found between parks construction and decrease in agriculture production in the study area.

City expansion has increased the agriculture land to non-agriculture activities which has created great problem of food crisis for the future generation, if it was not controlled then Pakistan will faces a food of threat and less export in the future. Such type situation is also existed in the study area and if the area of agriculture was not controlled then there will no land be left for agriculture cultivation in the future. Agriculture play great role for survival of life. The city expansion has significant association with the agriculture production declining in the study area (<https://iips.com.pk/impact-of-rapid-urbanisation-on-agriculture-of-pakistan/>).

Table 6: Association between different independent variables and agriculture production declining of the sampled respondents in the study area.

S.No	Independent variables	Independent variables responses	Dependent variable agriculture production declining			Total	Chi-Square P=value
			Agree	Not agree	Un-certain		
1	City expansion	Yes	259	17	41	317	X ² =141.7 P=.000
		No	006	02	07	015	
		Un-Certain	007	00	46	53	
2	House construction	Yes	249	17	73	352	X ² =20.9 P= .000
		No	10	02	04	017	
		Uncertain	13	0	17	030	
3	Shop construction	Yes	237	17	84	338	X ² =0.78 P=0.954
		No	13	1	3	017	
		Uncertain	22	1	7	30	
4	Road construction	Yes	252	11	88	351	X ² =30.43 P=.000
		No	10	3	4	17	
		Uncertain	10	5	2	17	
5	Educational institution construction	Yes	238	17	84	339	X ² =0.542 P=0.969
		No	12	1	3	16	
		Uncertain	22	1	7	30	
6	Hospital expansion	Yes	246	17	79	342	X ² =7.8 P=.09
		No	15	2	5	22	
		Uncertain	11	0	10	21	
7	Industry expansion	Yes	249	17	73	339	X ² =20.97 P=.000
		No	10	2	4	16	
		Uncertain	13	0	17	30	
8	Park construction	Yes	249	17	73	339	X ² =21 P=.000
		No	10	2	4	16	
		Uncertain	13	0	17	30	

Source: Field Survey 2023

Arsalan (2022) reported that housing societies has destroyed most land of agriculture in Pakistan. Majority orchards of mangoes were cut and on the places housing model were constructed. In 1960 the Pakistan exported wheat to other countries of the world while now they import wheat from other countries. The main reason is that most of agriculture land was converted to building in Pakistan. Many housing illegal societies are working in Pakistan which only earns the money while not care of agriculture land. Such situation also present in the study area. Many housing societies have made the house model in the city of Peshawar which have converted huge area in house modeling and have decreased the agriculture production.

The present study situation is also the same in the study area. It has declined the agriculture production

as well as disturbed the ecosystem of the rural and urban sector. The constructions have multiplied the pollution which flows in the canal and river and disturb the agriculture system of the rural area and made the environment unfavorable.

Land holding occupation average status comparison between 1998 and 2023

Land holding is the occupation of land by people in different era. This land holding shows the position of the person in the area. There only few people have occupied the land and majority has no land. In this table means of 1998 and 2023 have been shown. Table 7 shows land holding occupation average status comparison of 1998 and 2023 of the sampled respondents in the study area. The land holding mean 2023 is 1.9682 Kanal while 1998 was 2.6409 Kanal ,the difference is -0.67273, the percent change is

Table 7: Land holding occupation average status comparison between 1998 and 2023 of the sampled respondents in the study area (kanal).

Particular item	Mean 2023	Mean 1998	Differences	Percent change	Degree of freedom	t-values	P. value
Land Holding	1.9682	2.6409	-0.67273	-25.48	384	-9.018	.000

Source: Field Survey 2023

-25.48 while the degree of freedom is 384 and p value is .000., So it shows that the result is highly significant at .05 confidence level. It explain that the average land before was more while due to urban sprawl it decrease from 2.6409 to 1.9682 Kanal averagely due to urban sprawl. The agriculture land was decreased due to construction of road, houses, park and industries in the study area. Large number respondents have sold the land for marriage of their children, for medicine and for some business activity in the city and rural area due to less return from agriculture land.

Samiullah *et al* (2018) investigated that land holding play great role in the development of a country while in Peshawar District year by year the land is fragmented into parts through inheritance and become small and small which affect the agriculture production of district Peshawar. Similar situation is also existed in the study area. Since 1998 the land was 2.6409 Kanal averagely but now it reached to 1.9682 Kanal. There is no proper law for the land fragmentation control in the study area. If this situation is continued very soon there will be no land for agriculture cultivation in district Peshawar. Through urban sprawl most land of the urban and rural are used for building construction which have occupied huge land in district Peshawar but in future there will be no land for agriculture activities.

Conclusions and Recommendations

It was concluded from the finding that urban sprawl in the shape of houses construction, hospitals, parks, education institutions coupled with local population increase and rural urban migration, decreased agricultural land which decreased agricultural production in the study area. Agricultural land conversion into non-agricultural activities created many problems for local farmers. Individuals who were primarily farmers who lost their farmland due to conversion into residential and commercial land which cause to shortage of food that can be produced by farmers to feed their community and surplus to feed the nation. The huge influx of people in the area created the problem of

unemployment which causes the problems of dacoits, murdering, theft and other social evils. It also makes the environmental pollution in the Loss of vegetation and biodiversity, habitat functions, agricultural resources and soil. The study further concluded that it increased noise and air pollution, water pollution and alteration of the hydrological properties of water. Climate change was started due to higher energy consumption, and higher greenhouse gas emissions through transformation, degradation and fragmentation of the near areas. On the basis of problems and findings the following suggestion and recommendations are forwarded for future policy formulation for the purpose of controlling the urban sprawl and agriculture production declining in the study area. Construction of vertical Plates is the dire need of the day to accommodate maximum people in small piece of land to save land for agricultural production; strict laws action to regulate urban planning; policy makers should scientifically delineate urban development boundaries; strictly control the number of new parks and the scale of construction land in order to save degradation of agricultural to avoid food crises in near future; The government should take steps to provide fundamental amenities of life to rural areas in order to curtail migration to save the agricultural land of Peshawar for food needs of people; Government should develop the agro-based industries in the rural area to reduce migration pressure on the city; Vertical building policy should be developed in the country for controlling the urban sprawl in the city for safety of agriculture production; Credit should be provided to farmer in the study area for their input purchase for enhancement of agriculture production; Subsidized price should be given on inputs and support price on agricultural products for high return to farmer of the study area; Make proper drainage system in the urban area to ban polluted water into the irrigation canal for protection of agriculture production in the rural area.

Novelty Statement

Urban Sprawl has occupied huge land of agriculture in district Peshawar which has disturbed the ecosys-

tem of the city and the rural area which affected the sustainable agriculture for the future generation in District Peshawar.

Author's Contribution

Mr. Shah Fahad: Created the idea, conducted the research and wrote the article.

Akhtar Ali: Supervised the paper and helped in writing.

Conflict of interest

The authors have declared no conflict of interest.

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