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Impact of land use change on land values: A case of Jhangiwala, Bahawalpur City, Pakistan

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Abstract

Globally, land use change is considered a major issue that is responsible for expanding land values and converting agricultural land to urban and other uses. Therefore, main objective of the present study is to access the impact of changing land use on land values at the Jhangiwala, near the civil hospital and to draw a few suggestions to bring sustainability in land use and price inflation. In this attempt, primary data was collected through field survey in five selected housing colonies in the form of questionnaire. During analysis, total 100 persons were determined as sample respondents through random sampling technique and analyzed by applying descriptive statistics in SPSS software version 17. The resultant analysis explain that before the change in land use, major share of the land in colonies were well productive and used for cultivation purpose and later on used overwhelmingly for residential purposes. The price of plots in these colonies were substantially high as compared to the initial price. The size of purchased plots were varying and most of the buyers have purchased these plots during 2013-2017 for investment. The process of land use change and increase in land values have manifested both positive and negative impacts and anticipated to carry on. Thus, few suggestions were proposed in order to curb the issue of agricultural land conversion and regulate the hiking prices of land.

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Introduction

Worldwide, the Land Use Change (LUC) is considered a major issue of changing and modifying the nature of surrounding land and the utilization of land from one use to another. It is observed throughout the world and associated with numerous factors like population expansion, urbanization, development, and socioeconomic determinants etc. Generally, LUC widely defined as a process characterized by converting the land from one type of use to another. In most reported cases, the conversion happens from agricultural to urban uses (Azadi *et al*., 2011). This conversion usually followed by an increase in land value. Contrary to this, land value is a sign of land capability in relation to its utilization and use. It divides into the categories of natural value (productive land), economic value (real-estate) and ecological value such as parks and environmental conservation (Astuti, 2014; Verheye, 2009). At the level of land economy, land values are synonymous with land prices because the price of land is the manifestation of the value of land (Tilaar, 2013).

Since the land is one of our most precious assets, it encompasses surface, space, soil, provision of food and water, and a base for urban and industrial development (Verheye, 2009). Usually, the random expansion in the growth of city affects the pattern of land uses within the city and their encroachment to the adjoining settlements. There are incompatible conversions in land uses and undue encroachment into green areas in the surrounding communities that come out with the extensive cost for the social and economic life of local residents, particularly in urban fringes (Owoeye and Ibitoye, 2016; Farah *et al*., 2016). The main Agricultural Land Conversion (ALC) driving forces are attributed to economic, political, institutional, technical, infrastructural, social and environmental factors (Azadi and Barati, 2013). Hence, changes in land use is the ultimate result of many forces that drive millions of separate choices made by homeowners, farmers, businesses, and government (Heimlich and Anderson, 2001). At world level, the core determinants of the value and prices of land are land tenure, inherent production potential, expected earnings, and supply and demand as a result of the competition for land by different users. In urban studies, the urban bid rent model suggested that residential prices are decreasing with increasing distance from the major urban center. A particular land use can change into another land use as a piece of land can change i.e. as farmland before it becomes space to build residential uses.

Likely in Pakistan, commonly, the commercial and financial areas have the highest land values followed by retail areas i.e. in Karachi, the retail centers are dispersed usually all over the city. However, the land values of various retail centers differ in accordance with their location in respect to the city center (Akhtar, 2005). In Bahawalpur, it is found that as a result of the fast increase in population, rapid urban growth, educational and health facilities, employment opportunities city's land use is subjected to change mainly on peripheral agricultural lands. In addition, studying the relationship between urban growth and land use changes is of considerable importance (Mohsin *et al*., 2014; Khan *et al*., 2014; Arshad *et al*., 2017). This remarkable change in the city's urban land area has brought dramatic and rapid change in city's land use mainly by the straggling private housing schemes and other infrastructure and creating the administrative and managerial problems for local government for the provision of basic municipal services and amenities (Mohsin and Anwar, 2015). Besides, many socioeconomic characteristics of residents significantly affect ALC into housing schemes in Bahawalpur City viz. income, profession, availability of conveyance, provision of housing facilities, price of land per Marla, location and vicinity of colony and people purchasing power (Mohsin and Khan, 2017; Mohsin *et al*., 2015).

In Bahawalpur, it is thought that the economic and social forces are two more powerful driving forces in land use change. Therefore, the prime aim of the present study was to analyze the conditions and impact of the land use change on land values. While the main objective of the study was to access the impact of changing land use on land values at the

Jhangiwala, near the civil hospital and to draw a few suggestions to bring sustainability in land use and price inflation.

Materials and methods

Study Area

Bahawalpur City is a famous historic city distinguished in many respects particularly about its historical places, forts, and mosques. It also possessed a special place in the production of the mangoes, citrus, and dates etc. It is lies between 71º– 41´ east longitudes and 29º – 20´ north latitudes with a mean sea level of about 384 ft. The rapid rate of urban expansion due to a rise in population and economic growth is causing land use changes in fringe areas of Bahawalpur City. Jhangiwala is a locality in Bahawalpur City located 9km northeast to the city's absolute location. In recent years, the Jhangiwala road near to civil hospital is being faced notable land use change such as construction of dual road, establishment of civil hospital, drug testing lab, special education college, district consumer court, and many others open a new door of massive development i.e. the initiation of mushrooming housing colonies and towns on both sides of the road.

Data collection

For the current study, the data collected were primary as well as secondary. Primary data has been collected through a structured questionnaire during a field survey earlier of March-2017. The questionnaire contained the questions addressing mostly the land use change and its impact on land value. Necessary secondary data have been gathered from Tehsil Municipal Administration (TMA) Bahawalpur, site offices of housing colonies and few web sources.

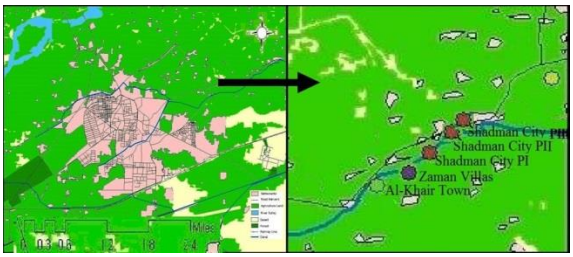

Fig. 1. Map of Bahawalpur City Showing Study Sites.
Source: Authors (2017)

Sampling and Sampling Procedure:

Five sample sites namely; Shadman City Phase I, Shadman City Phase II, Shadman City Phase III, Al-Khair Town, and Zaman Villas were selected and surveyed randomly using simple random sampling technique (Fig. 1). In order to know the total population and determine sample size, the total number of houses along with the additional information of vacant plots were counted and multiply them with four that is an average number of household members (Table 1). The obtained Fig 1. was showing the total population of the sampled colonies. Then the total population was multiplied with 9 and divided with 100 to get the sample size of 9%. After that, to find the average number of sample persons from each colony we multiply the population of each colony/ town with 9 and divided with 100 to obtain the sampled persons or respondents. The obtained percentage of sample persons varies and based on the number of houses of each colony/town. The questionnaires were distributed among the round respondents that were total 100 out of the 1,112 residents of the sampled colonies/towns.

Table 1. Sample Sites and Sampling Procedure.

Sr. No.	Town/Colony	Year of Establishment	Area (Acres)	Population	No. of Houses	No. of Vacant Plots	Sample Size (%)	Sampled Persons Average	Round Sampled Persons
1	Shadman City Phase I	2008	48	620	145	180	9%	55.8	56
2	Shadman City Phase II	2012	9.5	312	79	48	9%	28.1	28
3	Shadman City Phase III	2014	10	16	06	36	9%	1.4	1
4	Al-Khair Town	2007	3	136	40	04	9%	12.2	12
5	Zaman Villas	2014	12.5	28	08	55	9%	2.5	3
	Total		83	1,112	278	323	9%	100	100

Source: Field Survey (2017)

Data Analysis

The collected data properly manipulated, rearranged and tabulated before further processing. Descriptive statistics were applied in data analysis with the help of SPSS-17 software. After that, it was discussed in detail on the basis of findings. Maps of the study area (Jhangiwala) were prepared in ArcGIS 9.2 software using on-screen digitization, geo-referencing, rectification and reshaping functions.

Results and discussion

Type of Land before Change

Land utilization before the conversion into non-agrarian uses determine its value. Results express that about 82% of the respondents agreed that before the change in land use, their lands were well productive and used for cultivation of crops, whereas rest of 18% respondents replied that their lands were non-productive before the change in land use. Mainly, their lands were infertile or giving low output to farmers due to certain reasons e.g. high salinity, barren land. This makes clear that most of the land before a change was fertile and used for cultivation of crops. A study conducted in inter-mountainous states of the USA using traditional ordinary least-squares and spatial regression models found that various farm trends are related to population pressure, socioeconomic structure, and biophysical resources (Ahmed, 2015).

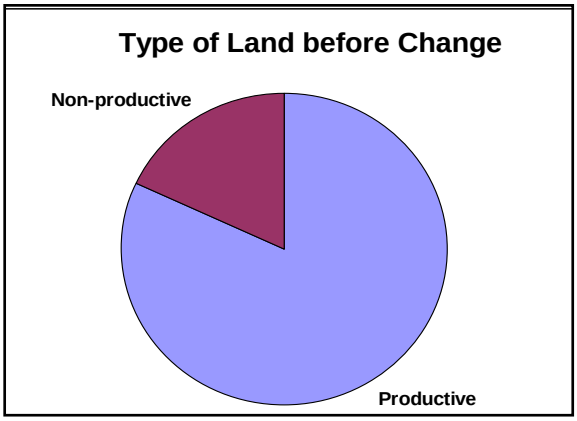

Fig. 2. Type of Land before Change.

Main Sector/Avenue

Fig. 3 portrays that about 72% major share of land was changed in residential purpose i.e. for establishing a vast number of housing societies and towns, while 12% land was changed for commercial activities such as constructing shops, filling stations, marriage lawns, and restaurants. Rest of about 16% of land was covered vacant plots waiting for building although most of them devoted for investment (selling or buying). These results suggest that the residential sector is the main avenue of changing land use for the sole aim of gaining maximum profit for each inch of land. Ahmed (1995) also asserted that the residential sector is claimed the major share of land in Bahawalpur. Generally, urban development that took place in fringing rural areas usually increases the value of farmland and enhances the opportunity for future industrial, commercial and residential developmental works. Kuminoff and Sumner (2001b) also agreed that basically agricultural conversion is not driven by low farm returns rather it is fastened by urban-agricultural periphery effects along with population growth.

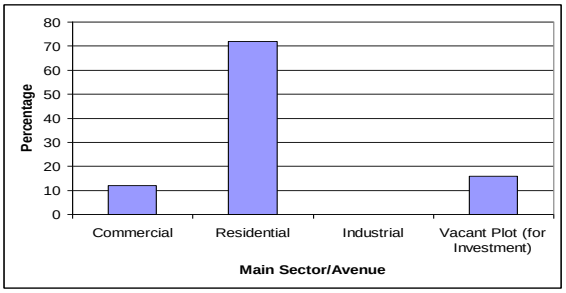

Fig. 3. Main Sector/Avenue for altering land.

Purchasing of Plot per Marla (PKR)

After analysis, fig. 4 express that 44% of the respondents have purchased the plot between PKR 220,000-300,000 per Marla mostly in high class residential colonies (Shadman City Phase I and Shadman City Phase II) and belongs high earning professions, whereas 30% were purchased the plot at PKR 100,000-300,000 per Marla in Shadman City Phase III and Al-Khair Town. Similarly, about 6% of respondents have purchased the plots at PKR 60,000-90,000 per Marla. These results indicate that a significant number of respondents were interested in doing business by purchasing land for investment. This is because of the initiation of several developmental works such as dual road, civil hospital; special education Degree College at Jhangiwala (study area) near the civil hospital during the last few years.

Thus day by day the land prices were increasing and making it extremely difficult for middle-class people to purchase a single piece of land. Moreover, table 2 also clarifies the results by showing the considerable gap between initial and price in 2017. Particularly in Zaman Villas there was highest gap with a difference of PKR 400,000 found between the initial and price in the year-2017. Mojica and Bukenya (2006) agreed that increasing need for farmland to non-arable uses has fragmented the agricultural land base and has risen up land values. Moreover, the price of land on these housing schemes considerably high and far from the purchasing power of a common man yet high class community intends to purchase land for residential purposes and some time for investment to earn a reasonable profit. Unfortunately, this trend is now turning a menace and engulfing pure farmland throughout the country (Mohsin *et al*., 2015).

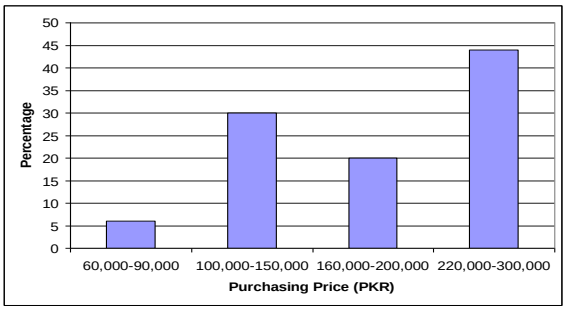

Fig. 4. Purchasing of Plot per Marla.

Table 2. Study Sites and their Initial and Price in 2017.

Sr. No.	Town/ Housing Colony	Price in 2017 (PKR)/Marla	Initial Price (PKR)/Marla
1	Al-Khair Town	300,000	125,000
2	Shadman City Phase I	300,000	50,000
3	Shadman City Phase II	400,000	100,000
4	Shadman City Phase III	300,000	90,000
5	Zaman Villas	500,000	100,000

Source: Field Survey (2017)

Size of Plot (Marla)

In study sites at the Jhangiwala road, price fluctuations have mainly determined the piece of land or plot bought by the people. As it is found that the land price in different colonies is very high beyond the purchasing power of most should be inserted the people so that 36% respondents were purchased the plot in a minimum size of 3-5 Marla (Fig. 5). About 32% have purchased the plot of the size of 9-11 Marla mostly belongs to the high-income class and were purchased for investment chiefly, 20% have purchased the plot of the size of 6-8 Marla. Remaining of the 8% was purchased the plot of 15-20 Marla and was ranked very rich class financially, whereas just 4% were purchased the plot of the size of >20 Marla mostly in Shadman City Phase I and II.

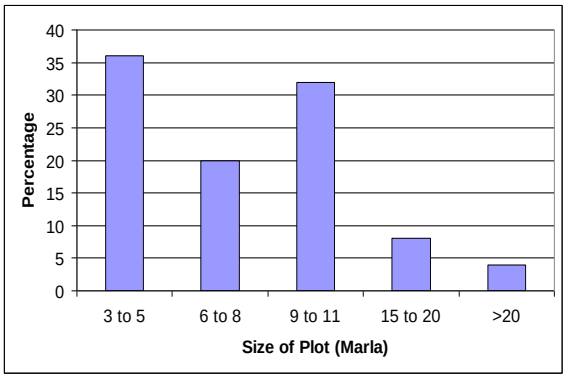

Fig. 5. Size of Plot (Marla).

Purchasing of Plot (Year wise)

The time period of purchasing of plot is important to show the trend of price inflation and willing for investment. Fig. 6 shows that 14% of respondents were purchased the plot during 2007-2009 when Al-Khair town and Shadman City Phase I was initiated. About 18% have purchased the plots during 2010-2012 and highest 42% respondents were purchased the plot during 2013-2015 and remaining 26% were purchased the plots during 2016-2017. These results suggest that majority of the respondents (about 68%) were purchased the plots during recent years of 2013-2017 instead of earlier years of towns and colonies establishment.

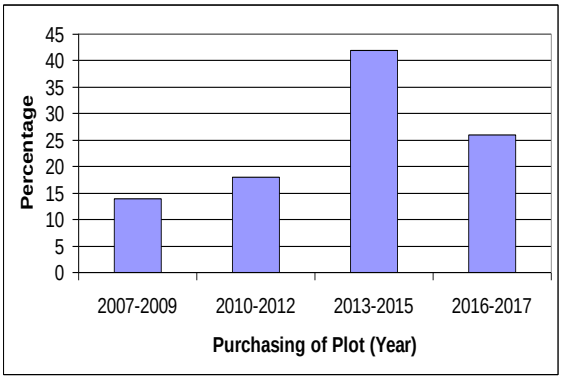

Fig. 6. Purchasing of Plot (Year wise).

Reasons of Buying Plot/Land

After knowing the period of purchasing of plot the interest is developed in us to find the major factors or reasons for buying a plot. The analysis revealed that most of the respondents (48%) were purchased the plots due to get rid of the family conflicts (Fig. 7). When they were inquire they shows that joint family, marriage out of a family, conflicts on property allocation (*Wirasst*) after the parents' death were the leading reasons of purchasing plot in a distance away. Secondly, about 42% respondents were purchased the plot due to enjoying fresh and clean air and environment. Additionally, 6% were purchased the plots due to avoiding noise and staying in calm away from city, whereas rest of the 4% were seeking fresh and clean water as it is perceived that agrarian land usually have a good fresh drinking water underground (Mohsin, 2014).

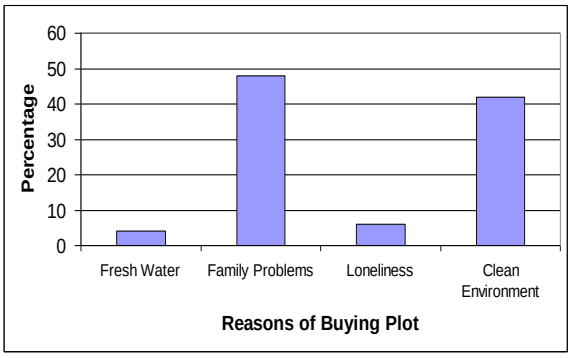

Fig. 7. Reasons of buying Plot/ Land.

Impact of Selling and Buying of Land on Land Price

The resultant analysis exposed that about 95% respondents were agreed that continuous process of selling and buying have an ultimate impact on the price of land that increased sharply. Whereas, only 5% respondents were not agree with this belief that selling and buying have any impact on price inflation. Verheye (2000) reported that the value and sale price of land are determined by its production and income generation potential. The increase in people income also boosts the consumption of farmland and enhances the value of land. Fausold and Lilieholm (1996) highlight that farmland and open space decreases quickly as an increase came in the surrounding property values. This is also true in case of Bahawalpur where land values are shooting up from last few years when the trend of conversion of farmland to urban land is become more common and people intension to sale out their farmland due to attractive returning price that is much higher from usual production output.

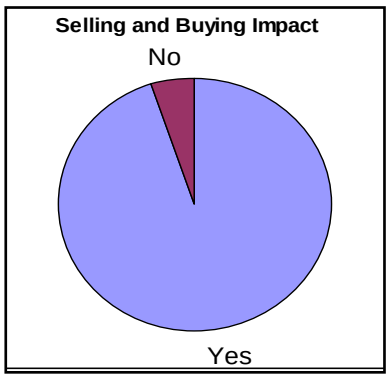

Fig. 8. Impact of Selling and Buying of Land on Land Price.

Source: Field Survey (2017)

Impact on Land Price/Value

Furthermore, when the respondents were asked about the impact on land price or value in terms of positive or negative both for buyer and land 85% explicitly replied that impact of land price hiking would be dangerous for agricultural land sustainability and geared the selling ratio of the land. Whereas, 15% respondents were argue that selling and buying have a good positive impact on price of land in terms of return gained by the buyer or seller (farmer) or even government in property revenue. Heimlich and Anderson (2001) increased demand for land due to growth increases land values, and thus the total property tax revenue. Irwin (2002) also concluded that different types of open space have significantly different effects on residential property values.

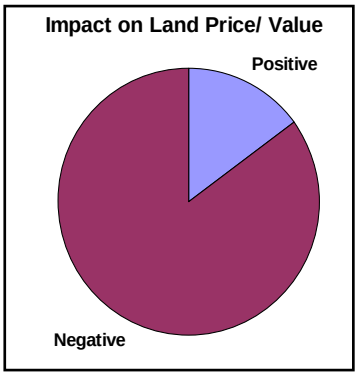

Fig. 9. Impact on Land Price/Value.

Table 11 and Fig. 10 clear that 60% respondents were agreed that selling of land would cause substantial loss of agricultural land, 25% feared that this change would increase the land price very high, 10% said that change in land use cause degradation of environment and rest of 5% alarmed that changing land use would attract more traffic and commercial activities produce problem of pollution. These results clear that most of the respondents were awared with the negative and harmful impacts of land use change. Previus study in Bahawalpur also found that these colonies were located inside the peripheral agricultural land creating high risk of conversion to adjacent farmland (Mohsin, 2014). Moreover, Bayramoglu and Gundogmus, (2008) agreed that development for some other purpose (housing) is expected to yield even greater net returns in the future, then the current land price.

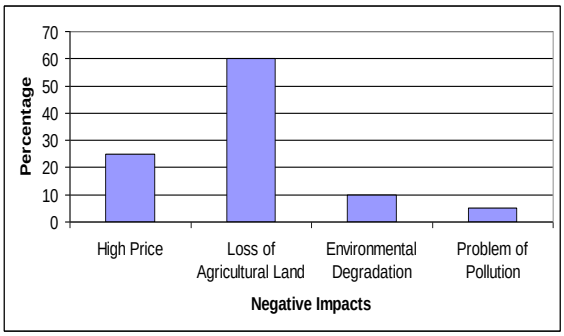

Fig. 10. Negative Aspects of Land Use Change.

Fig. 11 shows the positive impacts of land use change. About 60% respondents replied that they have purchased the plots for investment point of view or re-selling purpose when the price much hiked, 20% purchased the plot or land for constricting a wide and new home, 15% for avoiding noise problem and remaining 5% for getting new neighborhood. These results suggest that land use change also have positive impacts as well.

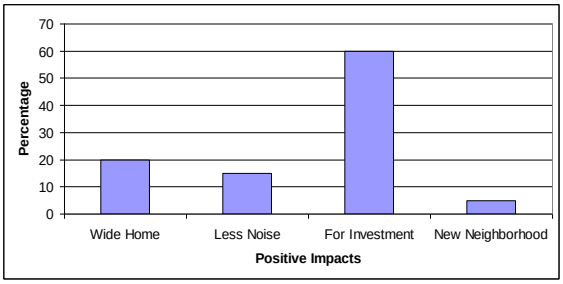

Fig. 11. Positive Aspects of Land Use Change.

Continuation of Process of Land Use Change and Land Value

Fig. 12 that 95% respondents were agree that the process of land use change and increase in land value would continue and to engulf more productive agricultural land. Whereas, just 5% respondents were disagree that the process of land use change and land value increase would not be continue perhaps due to sharp decline in land prices or imposition of certain restrictions by the authorities. Hite *et al.* (2001) agreed that in terms of socioeconomic factors, properties or land located near residences or housing society with higher numbers of new residents are more at risk to convert. Furthermore, Vitriana (2017) added that increases in land prices caused by spatial transformation have brought a significant annual increase in value and leads to many investors/buyers to utilize the increased economic value of peri-urban land.

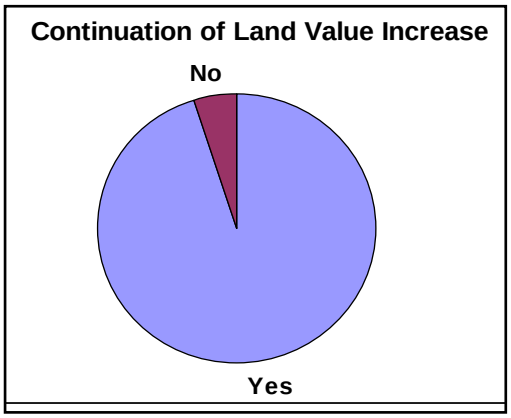

Fig. 12. Continuation of Process land use change.

Conclusion and suggestions

In terms of land use change, the findings of the study clarify that at Jhangiwala road most of the land before the change in land use, were well-productive and used for cultivation of crops. The major share of their lands was changed to residential purpose that purchased on reasonably very high price. The size of the purchased plots was varying from minimum 3-5 Marla to 9-11 Marla and mostly the buyers of larger plots (up to 10 Marla) have purchased these plots for investment point of view as they anticipating the higher price in coming years. This rate of buying and selling of these plots fluctuated timely but remained high during 2013-2017. The core reasons of buying these plots explored were both negative and positive aspects.

Among those, high price and loss of agricultural land were negative and wide home and for investment were counted positive. The process of selling and buying has also an impact on price of land. Majority of the respondents were explicitly expressed that impact of land price hiking would be dangerous for agricultural land sustainability and geared up the conversion process by converting the surrounding productive land. So, the study suggests few suggestions to curb the haphazard conversion of agricultural land to housing societies and regulate the inflating price of land;

1. Local residents (farmers) play their positive role by saving their lands.
2. Productive land should be safeguard by cultivation of crops.
3. Government should provide incentives to cultivators to lessen the rate of conversion.
4. Strict land use control policies and management system should be introduced and enforced by Government.
5. The standard land prices scheduled by the Government should be obligatory to avoid conversion.
6. Government takes steps to bring awareness among the masses to save their lands for maintaining the regular supply of food and cash crops.

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