Introduction

The study of land and land market has encompassed various disciplines ranging from economics and finance to planning, real estate and geography. The multiplicity of approaches which characterises the literature on land market is a consequence not only of the range of disciplines but also that of variety of concepts and methods used to analyze specific problems. The concepts used, however, have not always been discipline specific. Thus, e.g., land has been defined in various ways and we find a particular concept of land being used in different disciplines. The various disciplines however, have shown preference for a particular concept of land over its other concepts. Thus, in economics the concept of land as a factor of production has been more popular whereas in finance and real estate land is viewed more as property or an investment good than anything else. In planning and geography, on the other hand, the concept of land as 'situs' or 'space' is used more often than any other concept.

Furthermore, the areas of relative interest of professionals belonging to different disciplines have been different also.
Whereas the economists have been mainly interested in the determination of price in the land market, professionals in real estate and planning have been more concerned with problems relating to allocation of land between different uses. Treating land as a factor of production, the economists have discussed the working of the market and determination of price of land in that framework.

The analysis of land and land market, prior to nineteenth century had been confined mainly to the agricultural land market. The treatment of urban land was either at a prefunctory level or as peripheral to the main analysis. The reason for the preoccupation of economists with agricultural land in the land market analysis could perhaps be attributed to the dominance of agriculture in the economy of countries at that time. Moreover, the problems relating to cities were not serious enough to draw the attention of economists to the working of urban land market.

The coming of the Industrial Revolution and emergence of capital and labour as the more important factors of production relegated land to the background. Further, the fact that land shared some of the characteristics like durability and heterogeneity, with capital led to the belief amongst some economists that land was synonymous with
capital and that no separate theory of land market was required. Land, however, has certain unique characteristics like non-reproducibility, specificity to location, immobility, and indestructibility which make land a specie of its own and the study of land market a separate branch from that of capital market.

Paradoxically, it was the Industrial Revolution and the concomitant urbanisation which reinstated land as a distinct entity in its own right - albeit in a different context. In the context of increasing urbanisation the problems relating to urban land market aroused as much - if not more - interest as those of agricultural land market. This, however, is more true of the developed countries of the West than of the developing countries. The reason for this could be that our cities, as yet, have not reached the state of 'chaos' which characterised the cities of West in early 20th century; or it could be that the urban problems in relation to other economic problems besetting the economy are not serious enough to arouse the interest of economists in them. In most of these countries, agriculture continues to be the dominating activity and problems relating to agricultural land and rural areas attract more attention than those of cities.

Nevertheless, with increasing pace of industrialisation, the cities in developing countries too have been expanding at
a very fast rate and are experiencing more or less similar problems as were faced by the developed countries of the West in the wake of their earlier industrialisation. Thus, the problems of congestion, non-conforming uses, etc. are no longer a monopoly of the West. As the cities grow, the problems increase in intensity. Neglect of these problems may not only have negative effect on the efficiency of cities but may also result in spillout of these effects to adjoining rural areas. The problems of fringe area development, in this context, acquire special significance.

The growth of activities in an urban area has influenced the nature of the fringe areas which has changed from being a dominantly agricultural area to an area with mixed uses. The conversion of land in fringe areas from agricultural to non-agricultural uses creates several problems. These problems have attracted the attention of planners, people in real estate profession, geographers and economists. In the following paragraphs, we briefly discuss the contribution made by them in understanding the working of the fringe land markets.

The Concept of Urban Fringe and Working of Land Market in Fringe Areas Around a Static City

Urban fringe is defined as the area lying outside the boundary of an urban area. In a stagnant city with no
economic and/or population growth the land beyond the urban area will (continue to) be used for agricultural purposes only. The land utilization pattern of this fringe land would be determined by the revenue yielding capacity of each use. The use with the highest revenue yielding capacity will displace all other alternative uses. Assuming that a substantial portion of agricultural output is marketed, distance from the market will have an appreciable influence on the revenue-yielding capacity of each alternative use of land.

The revenue which a farmer can earn, during a given time period, will therefore be a function of crop yield in that time period, price of the crop in the market, cost of production and cost of transport. Thus, in algebraic terms,

\[ R = Y - P_c - T_c \]

where \( R \) = Revenue
\( Y \) = Yield
\( P \) = Price of crop in the market
\( P_c \) = Cost of Production
\( T_c \) = Cost of transportation.

Assuming that all lands are equally fertile, \( R \) will vary inversely with transportation costs which are a function of distance from the market. The value of land will be a function of the net revenue as defined here.
of distance from the market. Thus $R$ will vary with distance from the market. Specifically, as distance from the market increases, $R$ will decline and vice-versa. Thus lands located nearer the market will yield higher revenue (for any use) as compared to lands located farther off. This is shown in Figure 1.1. Figure 1.1 shows the revenue-distance function for a particular use. Different uses will have different revenue distance functions with varying slopes though all of them would be falling from left to right as distance increases. The slopes would depend upon the type of product (heavy or light), and other characteristics like perishability or otherwise of the product. It is conceivable that uses which produce perishable and/or heavy products would have higher stakes in locating nearer the market than other uses. They, therefore, would be willing to pay more than the other uses for nearer locations. The resulting land use pattern can be shown with the help of a figure.

For the sake of simplicity, we will consider only two alternative uses of land, say Crop-I and Crop-II. Figure 1.2 shows the $R-D$ functions of both the crops. $R_1D_1$ is the revenue distance function for Crop-I and $R_2D_2$ for Crop-II. As can be seen from Figure 1.2, Crop-I has higher revenue yield than Crop-II from boundary of the city (market-place) upto distance $OL$ from it. Beyond point $L$, however Crop-II gives a higher revenue. Thus, upto point $L$ Crop-I will be cultivated and beyond this point Crop-II will be cultivated. This
Figure 1.1: Revenue-distance function for a given use of land.

Figure 1.2: Revenue-distance function for two alternative uses of land.
process can be generalised for any number of crops. Thus the land nearest to the city gives the highest revenue. This hypothesis was put forward and empirically proved by Von Thunen as early as 1826.\(^3\)


\(^3\)Thunen Johann Heinrich Von, *The Isolated State*; an English edition of *Der Isolierte Staat*, Tr. by Carla M. Wartenberg, Ed. by Peter G. Hall. Oxford: Pergamon Press, 1966. Following Von Thunen's pioneering work in 1826, a lot of literature (both theoretical and empirical) developed on the rent-distance function. The notable contributions in the theoretical literature are by Dunn, Isard and Alonso who extended the work to apply to both agricultural and urban uses:


This literature, however, was not specific to fringe land markets. The work done on fringe areas (as we will see in next section) concentrated on other aspects of the problem. Though the variable distance remained an important variable in determining the value of land, it did not get much explicit attention in most of the writings. This was so mainly due to researchers' preoccupation with analysis of problems like speculation and sprawl or competition between agricultural and urban uses at any distance from the fringe. In empirical works, however, distance has always been included explicitly and has proved to be an important variable determining the value of fringe land. See Leroy J. Hushak, "The Urban Demand for Urban-Rural Fringe Land," *Land Economics*, Vol. 51, No. 2, May 1975, pp. 112-123.
A Growing City and Its Fringe Land Market:

The above analysis of fringe land market was confined to determination of agricultural land uses in this (fringe) area. This preoccupation with agricultural land uses can be justified in the case of fringe area around a static city. For a growing city, however, the dimensions of the problem increase tremendously. As the economic activities in the urban area increase, the demand for space for housing these activities and people increases. There is an increasing demand for land for industrial, commercial, residential, recreational, educational and other uses. The pressure of demand for land in urban areas manifests itself in the form of higher prices, more intensive use of land and spillout of demand to fringe areas. Thus, both agricultural uses and urban uses now compete for the use of lands in the fringe areas. The nature of the fringe land market changes and the process of price determination becomes much more complicated as a result of interaction of forces both from agricultural and urban sides.

The land in the fringe area now takes the character of marginal land. "This marginality derives not so much from any intrinsic qualities of the land as such but from what is known as 'situs' or position as distinct from
Thus the marginality originates from the characteristic of accessibility of this land to some centre of transportation. This area is now more accurately defined as the "area of transition between well recognised urban land uses and the area devoted to agriculture."\(^5\) The fringe land market is in a flux and both uses compete for the use of land in this area. The urban land uses, being more intensive and valuable, can almost always outbid the agricultural uses for this 'marginal' land.

The value of the fringe land for urban uses is based not only on its current productivity but also upon its expected future productivity. Actually, the urban demand for this land emerges much before the land is 'ripe' for urban use. This demand is mainly speculative in nature and is based upon the expected value of land in future.\(^6\) The


speculators enter the fringe market as buyers much before the urban pressure drives the genuine consumer out to the fringe areas.

**Phenomenon of Speculation**

Speculation in land may be carried on not only by professional speculators, but also by developers and sometimes even by the farmer-owner himself. The owner recognises the potential urban value of his land and refuses to sell it. Meanwhile, (till the land ripens for urban use) he continues to cultivate the land. Quite often, however, cultivation will be carried on less intensively than before. Farmer's investment in terms of capital and labour might decline since it is no longer worthwhile to sink money in agriculture if the land is going to be in agricultural use only for a short period. The uncertainty attached to the duration of 'ripening period' may result even in non-use of land till it is taken up for urban use.

This aspect of the operation of fringe land market has attracted the attention of many western economists and
planners. The free market mechanism does not result in smooth succession of land from one use to another.

The loss of production due to non-use of land may however be much less in case of farmer-speculator. This is because, the farmer, in most of the cases, would continue to do some sort of cultivation — thus, even though production may be less than before, it will not be nil. The speculators and developers who indulge in speculative activity are neither interested nor knowledgeable enough about farming to make use of land during this transition period. The speculator buys the land cheap and sells it dear. The speculator will hold the land till

the increase in market value is high enough to compensate him for the additional cost of holding land during that period. During this period the speculator does nothing to increase the productivity of land. Over-time as urbanisation nears, the value of land without any improvement increases by itself. The developer, on the other hand improves the land before selling it. The degree of improvement varies. The developer may just level the land, subdivide it and sell it or he may go all the way i.e., build residential, commercial or industrial building and then sell it off.

The speculative activity may not always be profitable. The chance for profit in holding suburban land for development arises entirely out of error in consensus or out of individual judgement more astute than the consensus ....... If there was complete knowledge as to the time of future conversion, as to value at that time, as to holding costs and as to discount rate then .... there would be no opportunity for speculative gain. A few years hence

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9 Marion Clawson, *op. cit.* p. 104.
the consumers might realise that the price which they paid was much higher than is warranted by the situation.\textsuperscript{10} The difference between this price (based on over-optimistic expectations) and the reasonable price (based on 'correct' expectations) is the price of ignorance or lack of information about future which becomes profit for the speculator. The over-optimistic expectations of the consumer which get reflected in prices might be due to two factors:

1. Neglect or undervaluation of certain future costs
e.g. transportation costs.

2. Overvaluation of certain future benefits, like amenity.
One of the major factors inducing the consumer to buy land outside the urban periphery is the amenity value of this area i.e., open space etc. Over-time as urbanisation progresses this amenity value reduces. The buyers, at the time of purchasing, take a myopic view of amenity value and over-pay.

The speculator can play a very important and constructive role in markets where there is time lag between emergence of supply and demand and where expectations enter the

\textsuperscript{10} Schmid has drawn attention to this phenomenon. See A. Allan Schmid, Converting Land from Rural to Urban Uses Washington D.C.: Resources for the Future Inc., 1968, pp. 30-32.
price determining process in an important way. Speculator buys land when urban demand for it is low and sells when demand is high. By properly timing his purchases and sales the speculator can reduce price fluctuations substantially and help in stabilising the market. This result, however, follows under certain assumptions regarding market organisation and the form of speculators' expectation function.\footnote{For details see Jack Carr and Lawrence B. Smith, "Public Land Banking and the Price of Land," \textit{Land Economics}, Vol. 51, No. 4, November 1975, pp. 316-330. They discuss the impact of speculation under different market conditions. Lawrence B. Smith in his paper "The Ontario Land Speculation Tax: An Analysis of an Unearned Increment Land Tax" in \textit{Land Economics}, Vol. 52, No. 1, February 1976, pp.1-12, discusses the impact competitive vs. monopolistic speculation has on fluctuations of prices.}

In the fringe land markets, these assumptions may not hold good. The speculators here are in the market for a 'quick kill' and once they make their profits, move on. Speculation based on over-optimistic expectations may lead to a situation of 'speculative boom' where one piece of land passes through the hands of a series of speculators. The failure of the realisation of these over optimistic expectations leads to panic in the market, the boom fizzles out. The impact of such speculative boom on the land market lasts...
a long time after it is all over. Speculation changes the basic legal nature of the commodity traded i.e., land.

"Due to the effect of real property law, as a tract of land goes through the speculative process it becomes encumbered by additional mortgages and other restrictions." ¹² In many a case the booms leave behind them vast tracts of land with heavy mortgages, unclear titles and no buyers. The valuable lands are turned unmarketable and valueless by 'explosive' speculation. ¹³

Even when speculation does not take this extreme form it does lead to a decline in the supply of land (by holding it back for long periods) and an increase in the price of land. It also leads to loss of production by non-use of one of the scarce and non-reproducible resources.

The genuine user of land - may be a developer or a consumer - may decide not to buy the higher priced 'speculatively held' lands. He would leapfrog these lands and buy lands held by non-speculators. This incidentally increases the

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¹³ Californian land booms are the best examples of such occurrences.
value of speculatively held land, some more by making these lands appear more "central" in location. From the point of view of the community, however, this leads to a non-compact form of development popularly known as sprawl.

Phenomenon of Sprawl:

Speculation, however, is not the only factor leading to sprawl. The very nature of the fringe land market leads to the occurrence of this phenomenon. The different plots of land in the fringe area are heterogeneous. This heterogeneity arises due to various features of land - fertility, soil type, topography, size, legal and tax status, location and accessibility. These factors (except fertility) carry a lot of weight as far as urban demand for sites is concerned. The sites having a package of favourable features are taken up for urban uses first - the others get left out. Again on the supply side, the farmer may refuse to sell because of his personal whims and fancies and contribute to discontinuous development.

\[14\] Lindeman, op. cit., p. 150.

Another very important factor causing sprawl is the multiplicity of operators in the fringe land market and their diverse expectations. Their independent and non-coordinated actions lead to development in pockets which are far removed from each other. Thus development does not proceed slowly and regularly taking in all the land as it goes, instead development will leap ahead to more distant tracts passing over nearby ones.  

Sprawl has been criticised on various grounds. The most often cited criticism is that it is inefficient and costly to the society. The sprawled development means that provision of public utilities and facilities will be more expensive. Longer sewage lines, electric lines and roads will have to be laid down increasing costs to the society unnecessarily. Another criticism of sprawl is against the visual impact and loss of amenity value which a non-compact development like this creates. A third criticism which has aroused lot of attention in many countries is the loss of agricultural (or for that matter any type of) production. The land which is

16 Harvey and Clark, *op. cit.*, p. 2.
17 Marion Clawson, *op. cit.*, p. 106.
taken up for development is used for urban purposes. Due to various factors it becomes unremunerative to continue farming on this land.\textsuperscript{18} Thus, these lands lie waste for years till urban development takes them up. This aspect of sprawl has raised concern in land rich countries as well as land scarce countries.\textsuperscript{19}

There are some economists who disagree with the criticism that sprawl is inefficient and costly.\textsuperscript{20} They argue that under certain market conditions discontinuous development is more efficient than continuous development.\textsuperscript{21} In

\textsuperscript{18}Wibberly, \textit{op.\citetext}, pp. 65-69.

\textsuperscript{19}Refer to Note 7.


\textsuperscript{21}Lessinger argues that sprawled development is more efficient if there are externalities present in the market. Imperfect information about future leads to the same result. Lessinger \textit{op.\citetext}. Ohls and Pines take a hypothetical case to prove that a discontinuous development is more efficient and less costly in the long run. Ohls and Pines, \textit{op.\citetext}. 
a society with fast changing fashions and technology a gradual filling in of space provides flexibility in urban development. These arguments are based upon the long term view of the problem. As is well known certain uses like commercial uses which are more productive than residential uses follow the latter uses. Actually, they become productive only after substantial amount of residential inhabitation takes place in that area. Thus, in the short run when residences are still coming up slowly, users would not find it profitable to use this land for commercial purposes. After a few years, however, commercial use will become very remunerative because of substantial demand for services and commodities from surrounding inhabitants. In this context, the discontinuous development ensures a more productive use of plots which got left out in the short run than if development had taken place continuously. In a sense these plots can be looked at as being kept in reserve for more productive future uses. Thus land market performs a very useful function for the society and leads to efficient allocation of scarce land resources over time.

Sprawl, thus, is just a form of growth, what is sprawl today may be a compact urban area of tomorrow. The

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22Boyce, op.cit., pp. 245-246.

23Harvey and Clark, op.cit., p. 6
problem arises when a static view is taken of an essentially dynamic phenomenon.

We could look at sprawl in a favourable light if and only if the land market process somehow could ensure that the plots which get left out in the short run are located such that they will be more productive in the long run. Sprawl is a result of interaction of various diverse forces in the land market. How does the market ensure such an optimal sprawled pattern?

What cannot be ensured by the land market mechanism can be attempted by the policy makers through various instruments they use to correct the inefficiencies of land markets.

Public Policy Instruments

Governments try to correct the inefficiencies of the land market either by substituting for the market wholly or partially or imposing controls on various variables in the market or by changing the values of the variables in

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24 As we know location of a specific plot is very important in determining its productivity. Except in cases where sprawl is due to speculative activity, such a result is highly unlikely.
In the first category we have measures like socialisation of land - all the land belongs to the State and its buying and selling is done at government determined prices. Alternatively, the government may try to influence the market outcome by actively participating in the land market through its land acquisition or land banking programmes. Under these programmes government first buys land and then releases it according to need of the area. All these programmes help in stopping or curbing speculation and sprawl and related problems and keeping prices of land in check.

Government could also try to achieve the above mentioned objective through comprehensive planning of the fringe areas.


The concerned government authority would plan for the whole area for a specified period of 10-15 years in advance. The plan will be based on forecast of future demand for land for various uses. The publication of this plan would make information relating to land use - present as well as future - available and would help in dealing with some of the problems created by free operation of land market.

In the second category of policy instruments we have various types of controls. These controls may take the form of zoning and subdivision control or price control or ceiling on land owned. By selective zoning - restricting development in certain zones and permitting it in others - the government can affect the pattern of development.\footnote{Clawson, \textit{op.cit.}, p. 109.} By choosing the right timing and right amount of land zoned it can successfully curb speculation and sprawl. In order to keep prices in control, care must be taken to zone enough land to satisfy urban demand and allow some competition as well, otherwise scarce supply and monopoly position of owners of the zoned land would result in high prices.

Another variation of this programme is dividing the whole of the fringe into various zones according to stages of development e.g. land to be developed, raw suburban land, agricultural
land etc. and allow development only in the first zone. As the first zone develops the second zone moves to the position of first, third to that of second and so on. This policy would lead to a more systematic and compact development in the fringe area than would be the case in a completely free land market.

Price control and ceiling on land-owned make speculation unprofitable. However, if price controls are continued for long they result in reduction in supply of land, leading to other problems. Restrictive provisions of the ceiling act may freeze the market altogether and may not achieve the objectives it was applied for.

In the third category we have policies like credit, expenditure and taxation policies to deal with the inefficiencies of the land market. In the same category we will have housing subsidies and agricultural support policies. All these policies change the values of the variables relating to demand and supply of land in the market and thus influence the market operation and its outcome.

An easy credit policy or housing subsidisation programme gives a fillip to demand for housing everywhere - some of which might be demand for housing on fringe lands. Tight credit policy will have the opposite effect. The credit policy operates

\[\text{Neutze, op.cit., p. 23.}\]
through the real estate market and its impact, normally, is not substantial. 29

Expenditure policies of the government can be utilised to influence the land-use pattern. This is so due to the fact that (land) development is very closely related to the availability or potential availability of public utilities and facilities like road, electricity, water sewage, school etc. 30 Thus, sprawl can be checked if government firmly refuses to provide (at present and in future) these services beyond a point, till the 'inner' areas are developed.

As far as taxation measures are concerned we have various taxes to deal with different aspects of the problem. A very high land value tax would deter speculation. 31 Or we could have a speculation tax or vacant land tax to achieve the same objective. A high land value tax would deter speculation by reducing speculator's net percentage gain from speculation; whereas vacant land tax would do so by increasing the cost of holding land. Speculation tax and capital gains tax will also fulfil this requirement by making speculation less profitable.

29 Neutze, op. cit., p. 45

30 Neutze, op. cit., p. 43.

A system of real estate taxes could be so devised as to curb sprawl. High taxes could be levied on land which is to be developed earlier (this will encourage sale of land) and low taxes on the lands where development is to be deferred. To discourage speculation on low taxed land a scheme of deferred taxation could be applied.32

These various policy instruments have been applied in many countries with varying degrees of success.33 The success of a policy measure or a combination of measures would depend to a great extent upon an understanding, by the policy makers, of the land market, the forces operating, behaviour pattern of operators and factors which influence these behaviour patterns etc.

It becomes clear from the above survey of literature that economists have not devoted much attention to understanding the fringe land market and interaction of diverse forces at work there. At best there have been fragmented studies focussing attention on one or other aspects of the problem of working of these markets. This might be due to the fact that problems relating to fringe areas have become pressing enough only recently to draw economists' attention. Most of the work in the field of fringe land market has been done by planners and real estate men. Economists are rather new entrants in this field.

32 For details, see Marion Clawson, *op.cit.*, p. 110.

33 Neutze, U.N., *op.cit.*, Chapters VI-VIII.
Even the few theoretical studies which have been done on the working of the fringe land market do not take account of all the forces which go into the price determination process of land in these markets. Most of them either take supply of land as fixed and having no 'say' in determination of prices or ignore various other important variables which go into the working of the market (e.g. assume away speculative activity etc.). Again the studies are related to discussion of some specific aspect of the problem. There is no full fledged model of such a market which would take account of all the dynamic forces operating.

Another factor relating to most of these studies is that the conceptualization of the problem as well as its empirical exposition is based upon the situation in the fringe land markets of the developed countries of the West. The conceptual framework of, and empirical conclusions drawn from, these studies may not relate well to the situation prevailing in the fringe land markets of the developing countries. It will, therefore, be worthwhile studying the working of these markets.

With this objective in view, we proceed to develop a conceptual model for the analysis of fringe land market in developing countries. The model would take cognizance of the pattern of behaviour of both buyers and suppliers in the market and would be based upon the situation prevailing in the developing countries. An appropriate methodology would be
developed to analyse the working of this market which would take into account the multidisciplinary and dynamic nature of the problem. The problems of speculation and sprawl would be analysed within the framework of the operation of forces of supply and demand in the fringe land market. It is expected that the model would help in a better understanding of the working of the market system.

Further, we would take up a case study of the city of Ahmedabad to illustrate the process of fringe development and related problems in a growing urban area. The choice of Ahmedabad, for this purpose, was governed by the considerations of its being a growing industrial city. The rate of growth of urban activities in this city, over the past few years, has been very fast and has had substantial impact on its fringe areas.

Plan of the Study:

The review of literature on fringe land market operations, in this chapter, besides indicating the major problems posed by the 'spillout' of urban activities into fringe areas underlines the need for a framework for the analysis of urban fringe land markets in the context of developing countries. Chapter 2 develops a methodology for analysis of urban fringe markets. Treating land as an investment good, returns from which flow far into the future, semi-dynamic and fully dynamic methods of analysis are outlined. The semi-dynamic method is
used as a preliminary to a fully dynamic method in order to clarify some of the basic concepts relating to fringe land market. Chapter 3 is devoted to the analysis of land market in a semi-dynamic framework. We start with very simple assumptions. These are: dropped subsequently. The phenomena of sprawl and speculation are analysed in the semi-dynamic framework. A fully dynamic analysis of fringe land market is attempted in Chapter 4. Viewing the conversion of agricultural lands into urban uses as a continuous process in response to increasing demand for space of growing urban areas we explain the working of fringe land market within this context. The impact of government intervention in fringe land market is discussed in Chapter 5. We confine ourselves to one form of government intervention only, viz. taxation. In Chapter 6, a case study of Ahmedabad's fringe land market is taken up. Various aspects of the functioning of land market are analysed for the period 1961-76. Chapter 7 summarizes the salient features of the working of fringe land market as visualised in the study, points out its limitations and suggests some policy implications relating to the working of Ahmedabad fringe land market.