



IJMIRD 2015; 2(2): 452-461  
www.allsubjectjournal.com  
Impact factor: 3.672  
Received: 03-02-2015  
Accepted: 18-02-2015  
E-ISSN: 2349-4182  
P-ISSN: 2349-5979

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## Equity Impact of Linear Land Acquisition Projects: A Case for Participatory Paradigm

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### Abstract

Basic infrastructure, linear one the foremost, has multi-dimensional linkages for growth and development. Being the major economic stimulant, its shortage is the commonest bottleneck for the developing economies to realize their output potential. However any infrastructural project needs large surface area which has to be annexed from the peasant community, tribal folklore, forest dwellers, and other weak and vulnerable groups. Land expropriation for project affected persons (PAPs), on the other hand, results into social-cultural and ecological disarticulation, psychological setback and economic collapse brought about by meltdown of productive capital base.

Characteristically, linear projects affect a part of total land-holdings of any affected 'revenue settlement' (i.e. a Revenue village) and generate inequity oriented or aggravating outcome with respect to affected and non-affected people, which the compensation fails to replenish for. This article makes deductive interpretation of equity impact of land acquisition in a given revenue settlement, and draws thereupon a theoretical argument for paradigmatic change in land acquisition process, for linear projects like highways, from an 'imposed extortion' to a 'participatory contribution and redistribution'.

**Keywords:** Linear projects; Land Acquisition; Compensatory Failure; Equity impact; Revenue Village; Participatory Paradigm; Locational Value; Gain Absorption Capacity; India.

### 1. Introduction

Land acquisition is the exercise of 'eminent domain' of the state to acquire private property in land for a public purpose (Law Commission of India, 1958). It is a compulsory land levy on subjected land-owners (subsequent land-losers) with three inherent features: a) supposed existence of a public purpose, b) elimination of private entitlement, and c) compensatory payment. It is an imposed change in land use and ownership to accompany long term capital accumulation as a fulfilling condition of neo-classical constant returns to scale production function (see for example 'non-scarcity' condition for land in Solow's 1956 model). It makes land a malleable factor of production, therefore. Land acquisition is a debilitating policy tool whose incidence is non-randomized and heavily loaded against affected populations. Whether with or without residential shift, it has embodied component of social fragmentation, cultural alienation, psychological disaster and disempowerment, because of the accompanying changes in habitat and ecology of living and work space (Cernea, 1999). It has been variously asserted that the compensation mechanism, as practiced in India, fails to provide meaningful relief to the displaced people (Mahapatra, 1999; Mathur & Marsden, 1998; Sainath, 1996). So does the resettlement. Ian Cook, Ramchandra Bhatta and Vidya Dinker (2013: 45) held that land acquisition causes three fundamentally rhythmic displacements i.e. 'social, cultural and economic'. The land-losers' life after official resettlement does not really get resettled because of the loss of "the interlocking links between agricultural land, people's daily lives, and the wider environment" (ibid: 45). Keeping in view the long term socio-economic considerations compensation mechanism ought to rely on monetary and non-monetary incentives (Carnes, et al, 1983). Compensation failure can be avoided by 'adequate equivalence' ascertained through reversibility-test (Khan, EIJSR, 2014). Justice S. U. Khan exclaims that "land Acquisition is no more a holy cow. At present it is a fallen ox. 'Everybody is a butcher when the ox falls'" (Gajraj vs. State of U.P. 2011: 245). The 'incongruous compensation mechanism' abridges the 'property rights' of the people (OTUBU, 2012: 27). Instead of being fair and just, it is also marred by discriminating tactics whereby discriminatory payment to different land-losers (Johnson & Chakravarty, 2013) are made by the authorities. The aim of strategic opacity applied by the

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concerned bureaucracy is just to have the land in possession by dodging and dissuading the PAPs from any collective action (Khan, 2013). Monetary compensation, as determined and paid by the 'competent' authorities, mostly results into total or partial meltdown of productive capital base of affected persons because of three reasons: a) inadequacy or shortfall of compensation equivalence, b) assignment of liquidated form of land-asset i.e. the compensation money, to consumption and other non-productive pressing needs, and c) intervening and dynamic changes like delays, institutional deficits, loss of output, income and employment, land shortage, inflation, and of course the poverty of the land-loss as a material deficit and decisional context (Khan M. I., IJLLJS, 2015).

This article is based upon participatory observation of land acquisition cases for many linear and non-linear projects. It draws, particularly, upon three cases of acquisition for NH 24 highway bypasses of around 40 km length in Bareilly district of Uttar Pradesh in India. These acquisition cases have been typical of land-losers' resistance on the one hand, and state and project authorities' behavior embedded in state's powers of 'eminent' as well as non-eminent domains. It is mainly concerned with land acquisition incidents for linear projects (LPs) like roads and highways etc. It is focused upon supposed articulation of modifications in land acquisition process for these projects. It is aimed at reduction of inequity and severe impairments like land-less-ness and loss of survival-base as well as creation, facilitation or preservation of land-losers' capacity to absorb the gains, if any, occurring due to the project or ascribable to it. The discussion is limited to the nature and effects of linear projects, especially, with respect to post-acquisition spatial equity, propensity to absorb prospective project windfalls, and the hypothesis of participatory contribution and redistribution.

The defining features, for our purpose, of a linear project are: a) infinitesimally narrow width comparative to infinite longitude, on a two dimensional plane, and b) contiguous land requirement, with affected land-holding ownership being scattered across settlements, so that acquisition incidence as well as expropriation for any settlement (e.g. a revenue village) are substantially less than one in terms of total land-holding and population of that settlement. In brief, apart from macroeconomic connotations, linkages and developmental gains, linear projects, too, have different types of direct and indirect effects on the spatial populations and PAPs over a range of time. However of the greater importance for our context are: a) spatial change in relative equity of pre and post-acquisition land ownership with respect to PAP and non-PAP populations; and b) post-acquisition 'gain-absorption' capacity of land-losers.

Roads and highways are the most apparent and appropriate linear projects, with large scale land requirement and explicit project windfalls indicated above. Hence the proposed scheme (the participation hypothesis) is being explained in

the background of highway projects. It is for explanatory as well as inferential purposes that we are choosing highway projects as the most representative of linear land acquisition projects. Though seemed not so gigantic, yet, most highway projects require an enormous amount of land e.g. a six lane highway between Agra and New Delhi will require 43,000 hectares (LARRDIS, 2013), or 430 km<sup>2</sup> that is an area more than the total area of a hundred revenue villages in the region. On an average a four lane highway affects about eighty land-owners and around eight hectare land per kilometer of length (Khan & Alam, IJMRD, 2015).

Michael M. Cernea is a prominent scholar on land acquisition and displacement. While accepting the need of the same he advocates internalization of rehabilitation programs in the project itself, and external financing for the same via developmental and credit agencies (Cernea, 1999). He also calls for institutional mechanisms like 'benefit-sharing' (Cernia, 2007). However, apart from these dimensions, a little change in the acquisition mechanism as suggested here can produce less pernicious results for many projects of not very large dimensions.

We start from a supposed settlement (a revenue village) which is subsequently going to be affected by land acquisition for a linear project, and make the following assumptions:

- i. That the degree of incidence of land acquisition is specific, and less than one, to a revenue unit or village in the sense that it affects fewer than a whole of total land-holdings of that settlement unit;
- ii. That the pre-acquisition land holding distribution pattern, irrespective of its merits or demerits, is an indicator of relative equity, and inequity as well;
- iii. That land is the only productive capital and means of subsistence for the people in the assumed settlement unit;
- iv. That there are three distinct land-owner individuals or groups with different degrees of land acquisition impact like totally affected, partially affected and not affected;

Land-holdings, as a matter of fact, do not follow a definite geometrical pattern, nor size. Rather, the surface alignment of holdings follows conveniently or historically determined non-uniform sizes and shapes. A project alignment, therefore, passes through different land patches, in such a way that it affects some ones more and some ones less. Suppose it goes along three equal size land-patches owned by three distinct owners X, Y and Z, and falls upon L<sub>1</sub> L<sub>2</sub> L<sub>3</sub> L<sub>4</sub> that is, due to locational position as shown in figure 1 ahead, equivalent of total area of X, partial area of Y and no area of Z. In so far as out of these three land patches the said project requires X in full, Y in part, and touches but needs no part of Z within the limited neighborhood, distributive dimensions of post-acquisition land-holding pattern will be inferior to the pre-acquisition one.

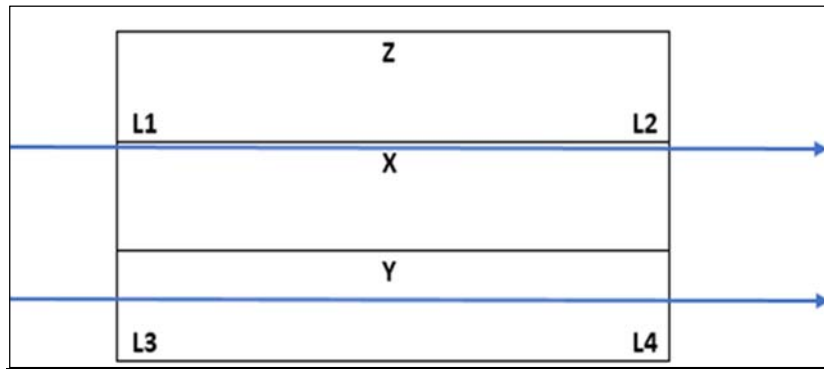


Fig 1: Linear Incidence

If we are to allow the idea of equity, as ‘fairness or justice in the way people are treated’ (online Merriam Webster Dictionary), or as the ‘state, quality or ideal of being just, impartial and fair’ (online Free Dictionary), to this sort of linear land acquisition projects, we find a lamenting deterioration. It can be conclusively inferred that equity, viewed in terms of distributive transition from status quo, has been disturbed with resultant land-less-ness for X, land-poverty for Y, and a neutral state for Z. In terms of subsistence X has lost her productive capital and source of employment and output in total, Y in part, and Z perchance succeeds to retain her economic kingdom. However it is not that simple. In fact Z has come out richer on a comparative scale but X has turned out to be a destitute for no fault of her. The failure of ‘equity equivalence’, in every part of it, is due to the functioning of ‘eminent domain’ of the state. It can be avoided only by a compensatory mechanism which qualifies ‘reversibility-test’ for adequacy whereby, *a compensatory entitlement is an adequate one if and only if it truly commands or fetches an exactly qualified capital base as foregone* (Khan M. I., IJIRD, 2015). Given the economic scenario and policy priorities this type of compensatory adequacy is a far cry. Hence we come to the hypothesis of ‘extended’ participation which, in comparison to contemporary land acquisition practice, is less damaging to equity, subsistence and gain-absorption dimensions, and which is much less dependent on compensation for avoidance of total land-loss, land-poverty and capital meltdown and so on (Khan & Alam, IJMRD, 2015).

Well beyond the conventional wisdom of acquisition and compensation underlying the Land Acquisition Act of 1894, the National Highways Act, 1956 and the recently enacted Right to Fair Compensation and Transparency in Land

Acquisition, Rehabilitation and Resettlement Act, 2013, the proposed simulation is aimed at avoidance of landlessness, exclusion and other conflicts involved, as well as at promoting equity and inclusion of the land-losers in the process of development, possibly via:

- a. Thinly distributing the pain of dispossession over a larger section on a shared basis;
- b. Producing ‘zero incident of landlessness’ for acquisition affected tenant population;
- c. Producing ‘zero incident of displacement’ for acquisition affected population;

**Equity Impact**

Before reaching at our hypothesis of participatory redistribution paradigm, here follows a discussion on ‘equity impact’ and other effects of a land acquisition incidence on the PAP and non-PAP populations. The description is attempted and presented in terms of resultant changes in the absolute and relative status of affected and non-affected people (land-holdings as well) in the close proximity of project alignment within our supposed revenue unit. We start from status quo and introduce acquisition and resultant variables gradually.

Suppose,  $S_0$  = Status quo, is a given initial equilibrium, as it is, without taking into account the merits or demerits of the status quo, and  $S_T$  = Terminal status after the change.  $S_0 \neq S_T$ , obviously.

Comparison between  $S_0$  and  $S_T$  (figure: 2) will involve, among others, the issues of equity, equality, distributive and redistributive justice etc. It is a comparison of the sort of inter-situational analysis. In fact, movement from  $S_0$  to  $S_T$  involves various dynamic and intervening dimensions. It may also involve effects of project windfalls as well.

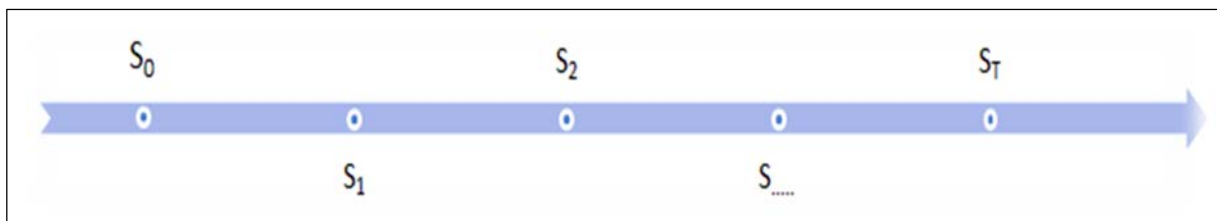


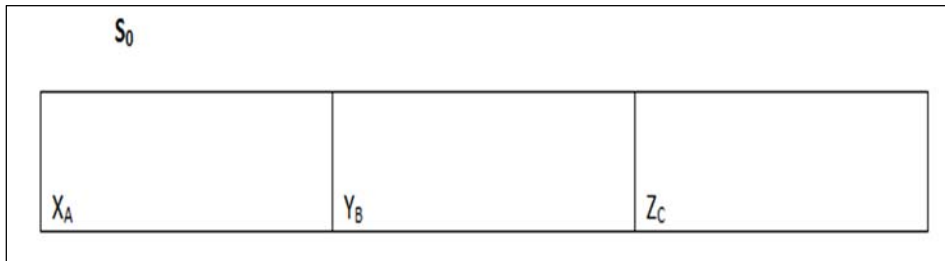
Fig 2: Status Dynamism

The movement from  $S_0$  to  $S_T$  may not always be instantaneous, and fixed. Depending on the time duration and cycle of events, it may be a series of movements involving

distribution and redistribution dimensions at every sequential turn. There may be numerous situation  $S_{1, 2, 3 \dots n}$  before reaching at  $S_T$ .  $S_T$  may, again, not be a terminal point. It is

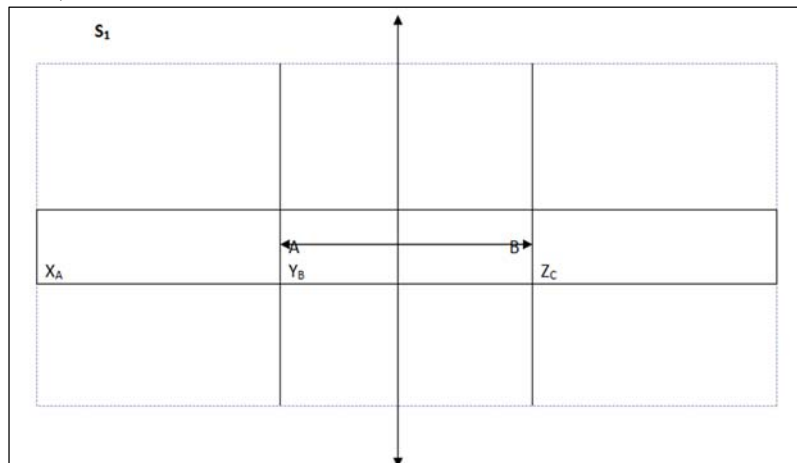
terminal only in the sense that we assume it to be terminal or stop our contemplation at  $S_T$ . Otherwise one can take as many initial status points  $S_0$ , as in need be there, to serve our purpose.

Now we start, from  $S_0$  as above, which is the case of initial land distribution in the said revenue settlement area. Plot  $X_A$  belongs to owner A,  $Y_B$  to B and  $Z_C$  to tenure holder Z (fig: 3) below.



**Fig 3:** Initial Land Distribution Situation

And, then move to  $S_1$  (figure: 4).



**Fig 4:** Highway Passes through B's Land-Holding

The highway road is to be built through the given land. As is evident, coincidentally, the width of the road  $A \leftrightarrow B$  equals the lengths of our assumed plots; it also passes through, exactly, in between the three plots. Let us look at the effects. Plots of land of belonging to individuals A and C do not get affected a little. The total land of B, however, gets acquisitioned by the authorities, for the purpose of highway construction.

Area needed per unit of road length is exactly equal to the area of road required earlier [area of road  $A_R =$  area of plot  $Y_B =$  area of plot  $X_A =$  area of plot  $Z_C$ ]. However, the area of road is, now, perfectly super imposed upon the area of plot  $Y_B$ .  $Y_B$  is acquisitioned totally. Owner B is completely dispossessed. Individuals A and C, apparently, maintain status quo.

$$S_{0A} = S_{1A} \quad (1)$$

$$S_{0C} = S_{1C} \quad (2)$$

$$S_{0B} \neq S_{1B} \quad (3)$$

And

$$S_{1B} < S_{0B} \quad (4)$$

Identity 3 is definitive. Identity 4 tells the deterioration; but the degree of deterioration in situational conditions for B is both finite and infinite; it is finite in terms of area lost, and infinite in terms of loss of capital base and capacity to avail of progressive opportunity. Identities 1 and 2 are both exact, and, non-exact. These are exact because the physical assets of A and C are constant. These are not exact also because the

relative value, the situational value and the economic value of their assets are non-equal to these at the previous  $S_0$  level.

$$S_{0A} > S_{0A} \quad (5)$$

And

$$S_{1C} > S_{0C} \quad (6)$$

Individual A and C are better off. Economic value of their assets has increased in situation  $S_1$  compared to situation  $S_0$ . Circumstances have warranted that owner B is completely dispossessed of her agriculture land and sustenance. Things have completely changed for her. Her status has become extremely worsened. As we had assumed at the outset, she has nothing to depend upon for source of livelihood. Neither any productive asset; nor any productive employment scenario! She has become completely dispossessed; perfect destitute! She is infinitely insecure: economically, socially, and psychologically. This is a bolt from the blues. It is a deadweight loss. A permanent loss! And no future, at all!

What is the value of the proposed highway for her destiny? What about the marginal disutility of the road to individual B? The degree of marginal disutility of land loss, for B, is beyond measurable limits; it is infinite. Rather, it is a series of infinity.

$$S_{1B} < \dots < \dots < \dots S_{0B} \quad (7)$$

While, on the other side of the same plane, we can rejoice enough in smiling faces of individual owners A and C. Their land is there where it was, earlier. Do they maintain status quo? Do we find pre and post highway situational equality in

their cases also? They have not lost their land; nothing at all. Can we confirm the result that  $S_{0AC} = S_{1AC}$ ? Our answer can be both a yes, and a positive no! They do not maintain status quo, either:

$$S_{0AC} \neq S_{1AC} \quad (8)$$

Does not it mean that post road situation has changed for the society, comprising of individuals A, C and B. As a whole? Definitely! What concern us, however, are the signs of inequality, and the direction of change, for different owners.

$$S_{0AC} > \dots > \dots > \dots S_{1AC} \quad (9)$$

Resultantly, both A and C have better fortune, absolutely as well as relatively. Their land was not acquisitioned for laying the road. Also, the locational value of their land has multiplied by exponential degrees. Their plots, now, open wide on a highway. It brings increased economic value to these pieces of land. It gives business and commercial opportunity to them. It provides transportation economies. It bestows enhanced esteem to the owners and accelerated valuation to these owners' asset, i.e. the land remaining there, and remaining on a highway! What a good fortune! And what a good windfall! The same road has different outcome scenarios, for immediate neighbors, living in the close vicinity.

Summarily, taking into account only the area of land belonging to A, C and B:

$$S_{1B} < \dots < \dots < \dots S_{0B} \quad (10)$$

And

$$S_{1A} = S_{1C} > S_{0A} = S_{0C} \quad (11)$$

Both A and C are better off, and B is exactly worse off, taking into account only one relative change, i.e. regarding area of land in ownership of A, C and B.

**Locational Value**

However, there are many dimensions to evaluate relative changes, locational advantage being the prime one. Accounting for the advantage of spatial locational value (LV) of left over land pieces, total asset value and economic status of individuals take different outcomes. Owner B,

having lost all the land that belonged, just yesterday, to her, suffers an infinite locational disadvantage.

$$LVS_{1B} < \dots < \dots < \dots LVS_{0B} \quad (12)$$

While, the farmers A and C enjoy, and appropriate, much locational advantage.

$$LVS_{1A} = LV S_{1C} \dots > \dots > \dots > LVS_{0A} = LVS_{0C} \quad (13)$$

Assumedly, before the change brought about by the proposed road all individuals, and hence the society as a whole, enjoyed perfect equality in terms of both the land asset area and its location quotient.

$$S_{0B} = S_{0A} = S_{0C} \quad (14)$$

As well as,

$$LVS_{0B} = LVS_{0A} = LVS_{0C} \quad (15)$$

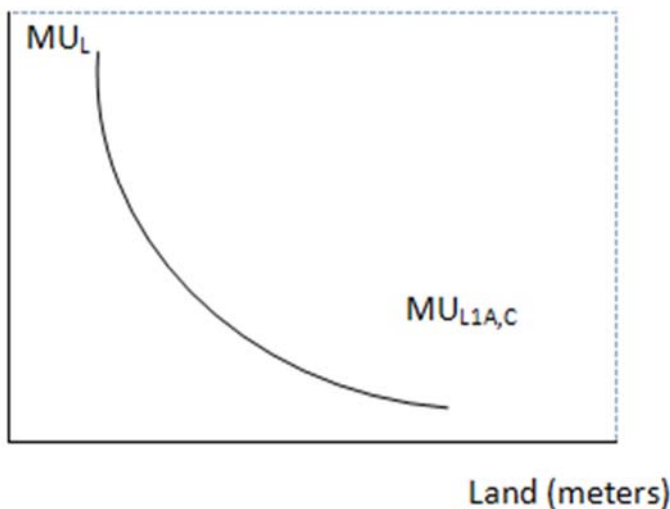
This condition ensured and ascertained perfect equity and equality in the society; and among the individuals. However post-highway society, in terms of economic equity and equality regarding land asset suffers a lot. It creates inter-temporal non-equality, as well as, inter-personal inequity. Combining the two effects, dispossession and location quotient together, the resultant aggregate effect, denoted by R, can be summed up in the following inequality.

$$RS_{1B} < \dots < \dots < \dots RS_{1A} = RS_{1C} \quad (16)$$

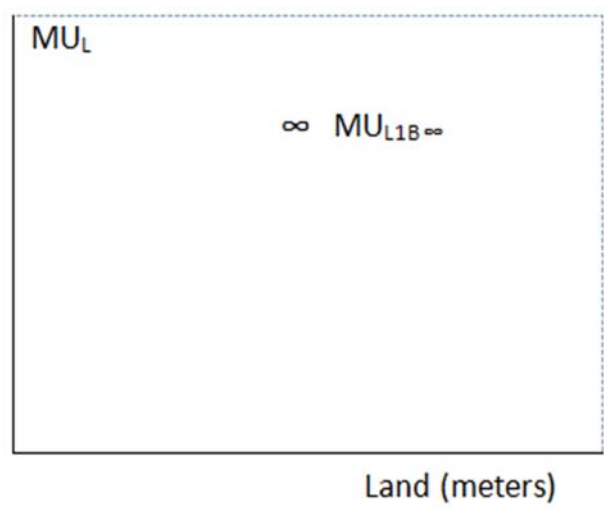
The locational advantage will not be limited to A and C only. Certainly, it will be felt over a longer radius, and increasingly so, over time, to other land owners in a greater vicinity. The argument, however, is kept limited only to the present society consisting of A, C and B.

**Marginal Utility**

Now we measure the plots in smaller units say, in square meters of area, instead of hectares, (which is too big for many farmers). Every square meter of their land will fetch more in exchange value. Their windfall gain in the asset value of land will produce an increase in total utility. However, the wealth effect will set in and marginal utility, MU, of incremental exchange value will start decreasing. Also the relative shares of A and C have increased in the society. They have become richer. Resultantly, the MU of land asset will also decline for them (figures: 5) ahead.



**Fig 5:** MU of Land for A Non-PAP



**Fig 6:** MU of Land for A PAP

By the same logic, the post-acquisition Marginal Utility of land,  $MU_{LIB}$ , for individual B, who has lost her total land, will become infinite (figure: 6) above.

Simultaneously:

$$TU_{S_0} = TU_{S_{0A}} + TU_{S_{0C}} + TU_{S_{0B}} \quad (17)$$

$$TU_{S_1} = TU_{S_{1A}} + TU_{S_{1C}} + TU_{S_{1B}} \quad (18)$$

Where

$$TU_{S_{1A}} > TU_{S_{0A}} \quad (19)$$

$$TU_{S_{1C}} > TU_{S_{0C}} \quad (20)$$

Also

$$TU_{S_{1A}} = TU_{S_{1C}} > TU_{S_{1B}} \quad (21)$$

In the original situation  $S_0$  all the farmers, or the society as a whole, enjoyed equal marginal utility from the land, as such. Certainly land might have been giving different output and revenue levels for different farmers, depending upon other factors. However our analytical assumption of *ceteris paribus* ensures the supposed equality dimension of farmers' land.

$$MU_{S_{0A}} = MU_{S_{0B}} = MU_{S_{0C}} \quad (22)$$

When we add the impact of wealth effect, due to windfall escalation in the value of the remaining land, the equality vanishes. Not only the marginal utility of A and C is less than that of B. The marginal utility of land for A and C is, now, less than that in the pre-acquisition situation.

$$MU_{S_{1A}} = MU_{S_{1C}} < MU_{S_{1B}} \quad (23)$$

$$MU_{S_{1A}} < MU_{S_{0A}} \quad (24)$$

And

$$MU_{S_{1C}} < MU_{S_{0C}} \quad (25)$$

The following inferences emerge out of the above discussion.

- i. Equity among the farmers has been disturbed, to the disadvantage of land-loser farmer B.
- ii. A redistribution of land from the relatively richer farmers A and C, whose marginal utility of land is lesser, to farmer B, for whom the same is infinitely high, will increase total utility, hence, total welfare of the society. The limits of redistribution being restoration of the pre-acquisition welfare level for farmer B, at the lower end; while maintaining the earlier level for A and C, as the upper edge.

- iii. It is in the interest of economic efficiency, welfare and justice that equity or proportionate equality among the farmers be maintained, in the limited neighborhood.

### Limited Neighborhood Equity

A limited version of equity, concerning the microcosmic society in question, can alternatively be paraphrased in terms of close vicinity and neighborhood. Let the society be constituted of three individuals, as earlier. They are immediate neighbors. Highway road acquisition, however, affects them unequally. So there are those who are affected-land acquisition affected farmers, in the neighborhood, AFN; and those who are not affected- non-affected farmers in the neighborhood, NAFN. Assuming initial status equality, among the farmers, we can find the following proposition.

$$S_{0AFN} = S_{0NAFN} \quad (26)$$

Post-acquisition:

$$S_{1AFN} < S_{1NAFN} \quad (27)$$

Assumed equality, and therefore supposed equity also, get disturbed. (It must be remembered that our assumption of initial equality is for convenience. It does not matter if we take inequality at the start. Post-acquisition outcome would have distorted the degree of inequality further; of course, it might change it either way.)

Equity requires that the proportion of equality, post-acquisition, not be worsened or it be maintained at least at the level of pre-acquisition equality.

$$\frac{S_{0AFN}}{S_{1AFN}} = \frac{S_{0NAFN}}{S_{1NAFN}} \quad (28)$$

### Extended Participation and Redistribution

A redistribution of land, from A and C to B, can increase both the total utility and the welfare of this imaginary society. If total land of all farmers in the neighborhood is supposedly included in the scheme and the area additional to road requirement, is returned and apportioned, among all farmers, the following picture may emerge (figure: 7).

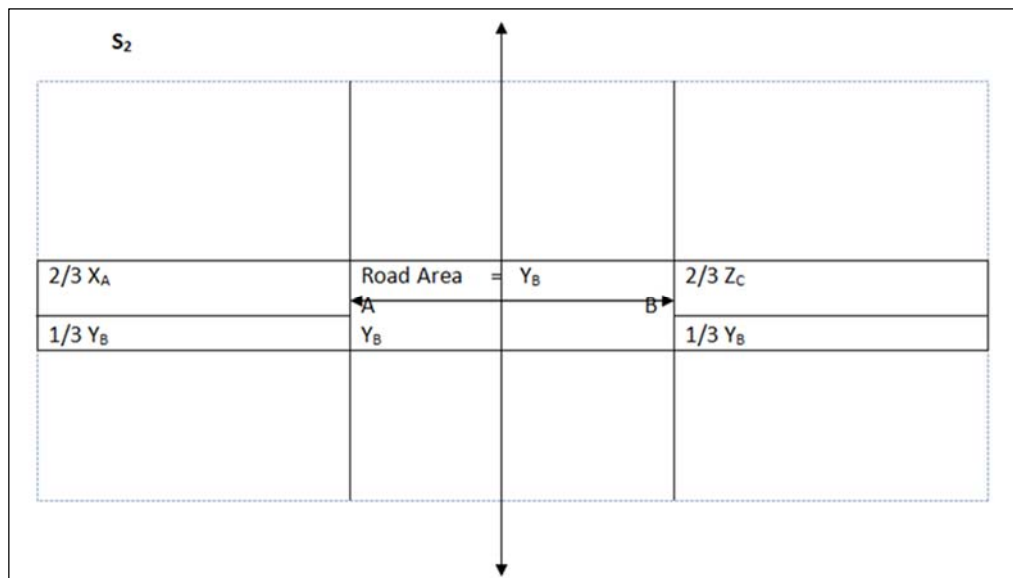


Fig 7: Extended Participation Result

In the example, firstly, total land of the neighborhood society is deemed to be acquisitioned. Secondly, a reallocation of total land is made. Thirdly, all excess or additional land is apportioned and returned to the society, in the ratio of original contribution of the participating farmers. Land is acquired. The road is made. Nobody turns landless. Equity among the farmers, or at least, the original proportional equality, is ascertained. Hence, it has two unambiguous outcomes:

- i. phenomenon of land-less-ness is not produced; and
- ii. Equity gap, in limited sense, is maintained or not let to worsen.

As explained, the loss of dispossession is shared by all farmers. No one faces absolute dispossession. The physical and absolute burden to the society is still the same. But, now, it is shared by all members in a proportion equal to their original physical possession of land. Each one has had contributed 1/3<sup>rd</sup> of her original holding. Each one has got

back 2/3<sup>rd</sup> of her previous land. Moreover each one enjoys a locational advantage. All fields, now, open onto the highway which is a growth point of future prosperity and economic opportunity at accelerated pace! In terms of utility:

$$TUS_2 = (TUS_{2A} + TUS_{2C} + TUS_{2B}) > TUS_1 = (TUS_{1A} + TUS_{1C} + TUS_{1B}) \quad (29)$$

Where,

$$TUS_{2A} = TUS_{2C} = TUS_{2B} \quad (30)$$

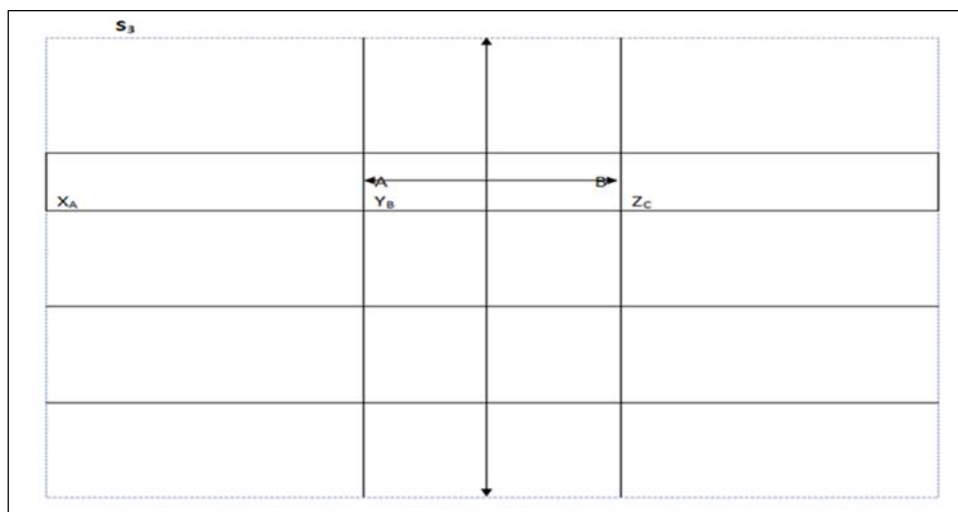
And

$$MUS_{2A} = MUS_{2C} = MUS_{2B} \quad (31)$$

Obviously  $S_2 > S_1$  for the society as a whole.  $S_2$  is a better option, if it can be reached at. It ascertains equity among all the participant members of the society.

**Explanation**

Now we introduce a little complexity into our scheme. Imagine a ground position of the following (fig: 8) type.



**Fig 8:** Ground Position

Our task starts with the determination of scale of extended participation. Supposing it at 1:3 again, we will include more lands up to the actual required width of land for road; at each side of the road. We are including 3 times more land. Land beyond our radius does not concern us. However, for the sake of convenience there can be some (say, a ± X %) flexibility to change the radius, in case of a field going to such distance. Or a field at the outer end may be left over if it extends into by not more the X% of the radius, r.

Now, there comes the issue of ordinal assignment. The sequence can start from any point. However a convention can be honored. For convenience, we may start from right hand side of the down road, from any reference point, move forward, complete the numerical order in continuation to the other side and then assign orders to plots in the middle or in between. Divide the number by 2, and we have the number of plots to be demarcated at each side, in the same ordinal manner. Third is the determination of the rate of further discount, if any, for any other common purpose like forest zone, greenbelt, common purpose land plots etc. Then the total land area is to be diminished by the total discount factor. Be it 1/3, but it can be maintained at the same, or at a higher or lower level.

The area net of the road is to be returned back to all the participating farmers in the proportion of their original land area. The fields or the land plots shall be allotted in the same serial order. Ordinal change could be allowed if and only if the degree of area involved is miniscule, it has become absolute necessity, it is mutually agreed upon and communicated in written, or it does not affect the other participants adversely. Social purpose plots can be left on suitable places, decided by the majority of participating farmers.

There are two critical determinants, each depending upon the other:

- i. The scale of extension, e.g. 1:1, 1:2, 1:3, ... and so on; and
- ii. The rate of or the proportion of discount.

Normally, it would be wise to keep the scale of extension and rate of discount same on both sides. However, if conditions warrant, these constants can be fixed at different nominal values. For example, there is a village or a residential locality, on one side, and the space is available only on the other side, then it would be practicable to apply the same procedure only for the available side. For the sake of very small participating holdings a minimum size (floor

holding size) may also be ascertained for bouncing back to the participating owner.

Common property resources can also be dealt with in the same manner. Some individual may have very small holdings. These holdings, resultantly, may become too small to give economic shape and size. Such holdings may be grouped together and assigned *en block* at appropriate and acceptable to all, locations; with the provision of safe passages and pathways, the same ordinal arrangements being honored. If locational advantage does not weigh high, even then the hypothesis is useful.

This model of land acquisition, simultaneously, eases the pressure of compensation and rehabilitation. The state can

relax, and the project authorities can take a sigh of relief, as well. However, it should not be inferred that this mechanism of redistribution makes the issue of compensation redundant. Compensation has still to be awarded, as a matter of farmers' right. But the amount of compensation does not remain an issue of disproportionate dimensions. An amount fixed at some appropriate ratio of total compensation amount may be awarded for development of educational, health and other common facilities, for the affected farmers in particular. The amount of common property assets can be pooled together and earmarked for the same purpose, simultaneously. The practical scheme of the model can be understood as follows.

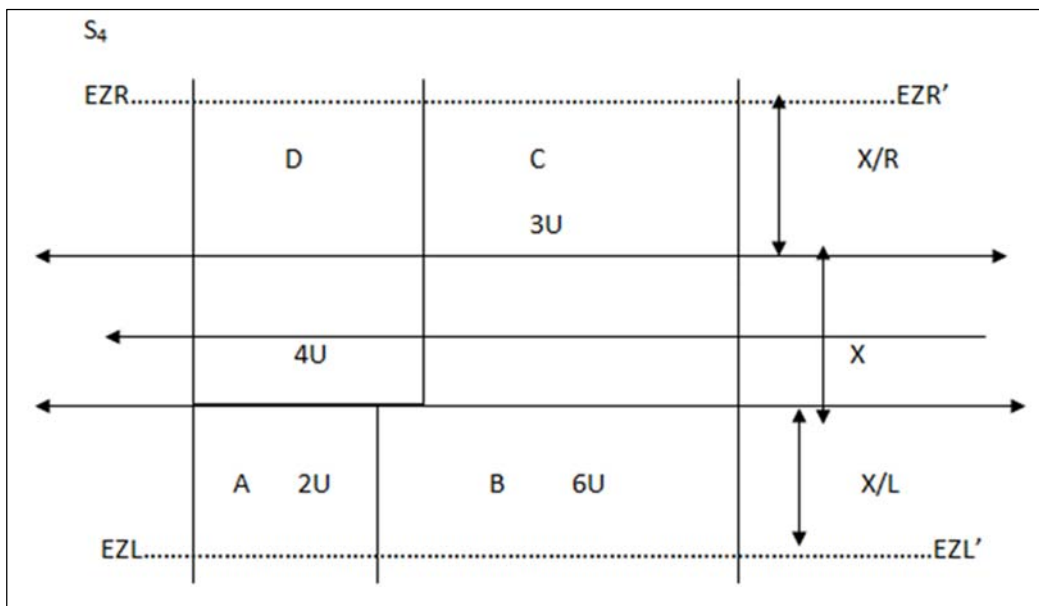


Fig 9: Practical Explanation

As shown in figure 9 highway is planned through a neighborhood cluster of plots A, B, C and D. X is the total width of road. Within the revenue village it requires 5 units of land area. Assumedly, we are extending participation zones to both the sides, exactly equal to road width- X/R and X/L, to the right and left sides of the road. EZR-EZR' and EZL-EZL' are our hypothetical zones of extension; also the zones of prime locational advantage. It has to be kept in consideration that our zone of participation cannot accommodate too much or too little additions or deletions i.e. changes which are not within  $\pm 10$  percent. Whatever be the actual areas of the plots, for our purpose, participatory area of the respective plots is as ahead- plot A has an area of 2 units, B has 6 units, C measures 3 units and D is equal to 4 units. In total we have 15 units of area, contributed by 4 farmers. We have assumed an extension zone ratio of 1:1 on each side. Extended participation ratio is 1:3 of road requirement. Hence a total of  $10/3$  units of area will be used by the road; while  $10/3$  area will be left over on right hand side, and the same  $10/3$  area will remain there on left hand side.

Share of each farmer can be calculated as follows.

Scale of extension,  $ES = 1:3$   
 Total area,  $TA = 15$  units [= Project area P  $\times$  ES]  
 Discount factor,  $DF = 3$   
 Road area,  $RA = \text{total area} / \text{discount factor} = TA / DF = 15 / 3 = 5$  units.  
 Reallocation factor,  $RF = 2/3$   
 Reallocation area,  $RA = \text{total area} \times \text{reallocation factor} = TA \times RF = 15 \times 2/3 = 10$  units.  
 Reallocation area on each side  $RAs = \frac{1}{2} \times RA$ ; or  $RAs = \frac{1}{2} \times TA \times RF$   
 We can calculate the area being given back to each farmer, in the same way:  
 Proportionate share of farmer X,  $PSX$   
 $= \text{original area of land of X} / \text{total area of land} = XA / TA$   
 Actual area of X being returned to her, or entitlement of X (EAX)  
 $= \text{share of X} \times \text{reallocation area} = XA / TA \times TA \times RF = XA / TA \times TA \times RF$   
 $= XA \times RF.$  (32)  
 Using these identities we can easily calculate the areas to be returned to the respective farmers, as shown in the table 1, below.

**Table 1:** Exemplary Worksheet

S. No.	Farmers	Original area	Formulae	Calculation	Entitled Area
1	A	2 units	$X_{A_A} \times RF$	$2 \times 2/3$	1.333 units
2	B	6 units	$X_{A_B} \times RF$	$6 \times 2/3$	4.000 units
3	C	3 units	$X_{A_C} \times RF$	$3 \times 2/3$	2.000 units
4	D	4 units	$X_{A_D} \times RF$	$4 \times 2/3$	2.667 units
5	Total	15 units	$TA \times RF$	$15 \times 2/3$	10.000 units

### Conclusion

The analysis rested upon 'equity impact' of linear land acquisitions. Exploiting the phenomena of post-acquisition utility of remaining land and occurrence of use and exchange value windfalls, it proposed a participatory 'extended' scale of acquisition in the first instance, followed by eventual land return in certain proportion to all the participant land-losers; so that no one gets exclusively hurt and no one turns out land-less while the cohort fares together. The implications are supposed to be equally valid for other acquisitions of manageable size, and with less than one degree of incidence on a population settlement.

In the present time when relatively small and medium size acquisitions are becoming more prevalent the participatory contribution and redistribution mechanism can be fairly advantageous provided that the political establishment develops an informed, and sympathetic to land-losers, policy initiative and the executive and bureaucratic machinery comes forward for bearing a little inconvenience of ground work. The hypothesis suggested here does not only offer "a possible solution to the problem of satisfactory rehabilitation and resettlement" (Cernea, 2007: 1033), but also provides an inbuilt mechanism for the minimization of abject penury and capital base meltdown, and subsequently the need for rehabilitation and resettlement.

### Acknowledgement

This article is devoted to the farmers and their families who have undergone the trauma of development caused land acquisition and displacement. Basically, it owes to the bestowed favor of compulsory expropriation affected farmers of district Bareilly in Uttar Pradesh province of India. They extended him the valuable opportunity of working and learning with them. Author is extremely thankful to these bearers of the unbearable burden of 'eminent domain'.

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