

# Analyzing Impact of Town Planning Scheme Intervention on Land Values

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**Abstract:-** Town Planning Scheme is one of the methods of implementing the proposals of development without tears as, as far as possible nobody is dispossessed from land. The advantage of preparing Town Planning Scheme is that, land for public purposes are handed over without any monetary compensation and there is provision of incremental contribution from the owners of Original Plots. The Incremental Contribution is decided by the Arbitrator by deciding the values of Semi-Final Plot and Final Plot. However, many times objections are registered by plot owners before the Tribunal of Appeal because of deviation between valuations decided by the Arbitrator and Market Forces. Valuation of land is very subjective in nature and is mainly governed by the perspective of the individual Arbitrator. Subjectivity and perspective of individual Arbitrator are governed by knowledge, experience, intuition and understanding of Market Forces. It is difficult to address this kind of subjectivity and individual perspective totally in arriving at valuation of Semi-Final Plot and Final Plot. However, process of arriving at valuation of Final Plot can be rationalized to minimize discontent resulting because of it.

In this research paper, analysis of impact of Town Planning Scheme intervention on land values has been carried out for rationalization of valuation of Final Plot using Analytic Hierarchy Process.

**Keywords:-** Town Planning Scheme, Final Plot, Valuation, Rationalization, Analytic Hierarchy Process

## INTRODUCTION

Land is the most basic of all economic resources, fundamental to the form that economic development takes place. Its use in an urban context is very crucial for shaping the effectiveness of functions of cities and gets the principle benefits from urban economic growth. Land is required for any sort of development, such as, Residential, Commercial, Industrial, Recreational, Transportation, Public-Semipublic, etc. in urban context. Its ownership is a major determinant of the degree of economic inequality which causes to increase in the value of land due to fixed supply and locational immobility. Land value increases when demand for land exceeds the supply of available land or if a land parcel has intrinsic value greater than neighboring areas (Chen, 2019). High capital investment is required for both acquisition of land and development of land, which is beyond the capacity of many Urban Local Authorities and even State Government due to monetary reasons (Ahluwalia, 2015). The land required for development can be made available with various methods. Town Planning Scheme (TPS) is one of the methods of implementing the proposals of development without tears as far as possible nobody is dispossessed from land. TPS is the oldest and most direct form of Public Private Partnership without being heralded as Urban Local Authorities for development of land. Benefit sharing is the basic principle in the TPS and therefore, it is the partnership between land owners and authorities facilitating the planned development. TPS can act as a tool for Infrastructure Financing through better leverage of land banks with the Urban Local Authorities and proper valuation according to market rate (Ballaney, 2015). The advantage of preparing TPS is that, land for public purposes are handed over without any monetary compensation and there is provision of incremental contribution from the owners of Original Plots.

The Incremental Value is arrived at by the Arbitrator by deciding the Semi-Final Plot Rate and Final Plot Rate. Calculation of Incremental Contribution is based on the valuation of Semi-Final Plot and Final Plot. However, many times objections are registered by plot owners before the Tribunal of Appeal, against valuation decided by the Arbitrator. Registration of objections is resulting into delay in finalization of TPS and its implementation. Valuation of land is very subjective in nature and is mainly governed by the perspective of the individual Arbitrator. Further, land is highly non-standardized commodity and locational attributes of land are playing very important role in its valuation. Subjectivity and perspective of Arbitrator and land owners are varying in nature and cause of discontent in valuation arrived. Cause of discontent is deviation between valuations of Final Plot decided by the Arbitrator and Market Forces. Subjectivity and perspective of individual Arbitrator are governed by knowledge, experience, intuition and understanding of Market Forces. It is difficult to address this kind of subjectivity and individual perspective totally in deciding valuation of Final Plot. However, process of arriving at valuation of Final Plot can be rationalized to minimize discontent resulting because of it. Therefore, understanding of preparation of TPS in the context of Maharashtra State is necessary to rationalize the process of valuation.

## PREPARATION OF TOWN PLANNING SCHEME IN MAHARASHTRA STATE

Enactment of Town Planning Act, 1915 initiated preparation of TPSs for areas in course of development within jurisdiction of Urban Local Authority. Subsequent, enactment of Bombay Town Planning Act, 1954 replacing the 1915 Act introduced the concept of Development Plan as the main planning instrument retaining the TPS for implementation of the Development Plan. This act was applicable for development of declared areas and not for the region as a whole causing disparity in development. Considering this, Maharashtra Regional & Town Planning (MR&TP) Act, 1966 has been enacted to prepare Regional Plan. Regional Plan is to regulate the development in the areas outside the jurisdiction of the Planning Authority and retains the provisions for the preparation of Development Plans (MR&TP Act, 1966). Till date various TPSs have been implemented in the Maharashtra State under the provisions of above mentioned acts. The Government of Maharashtra has stated the Maharashtra Town Planning Scheme Rules, 1974 in which the process of Physical and Financial Planning of TPS is prescribed. Financial Aspect of TPS starts with the Redistribution and Valuation Statement according to Sub-Section (v) of Rule 6 of these rules. The statement is called as Form "B" earlier; however, in practice it is stated as Form No. "1". Financial Aspect of Original Plot (OP) Value, Semi-Final Plot (SF) Value and Final Plot (FP) Value are stated for every plot owner and the reservations in TPS are illustrated (MTPS Rules, 1974). The Redistribution and Valuation Statement act as statement for directives to the Planning Authority while redistribution of new ownership proofs called as Property Cards to the new owners. These entries of values of land area are assisted by the Revenue Department of the state, after the survey of area has been carried out by their officials. These entries can also be challenged before the Tribunal of Appeal, if objection is received about area measurement too. The Redistribution and Valuation Statement has various contents that are explained as following based on MTPS Rules, 1974:

- 1) **Original Plot:** Original Plot is a plot, or a portion of land held in one's ownership and numbered and shown as one plot in a TPS.
- 2) **Semi-Final / Reconstituted Plot:** It is the plot which is altered in the ownership or in any other way by making a TPS.
- 3) **Final Plot:** Final Plot is a plot allotted in Final TPS.
- 4) **Original Plot Value:** It is the market value of Original Plot on the date of the notification of intention to prepare a TPS, by the Planning Authority. The resolution of the Planning Authority to that effect is required to be published in the official gazette and the said date of publication in official gazette will form the crucial date for valuation of Original Plot.
- 5) **Semi-Final Value:** Semi-Final Value of the Final Plot is its value based on improvement of plot because of change in shape of the plot (irregular plot made regular by either addition of the adjoining land or subtracting part from its own holding) without taking into consideration other improvements in the area like garden, public utility sites, etc. This value will be estimated as on the date of notification of intention to make of TPS.
- 6) **Final Plot Value:** It is the value of the Final Plot estimated on the date of notification of intention to make a TPS on the assumption that all the improvements contemplated in scheme have been carried out.
- 7) **Incremental Value:** It is the increase in value of land considering the development activities contemplated in the scheme have taken place according to Section 98 of MR & TP Act, 1966. It is difference between Final Plot (FP) Value and Semi-Final (SF) Plot Value.
- 8) **Incremental Contribution:** It is the value up to 50 per cent of the incremental value of the land according to Section 99 of MR&TP Act, 1966. It can be less than 50 per cent if the total cost of the scheme is less than 50 per cent of the scheme. It is used by the Planning Authority for taking up developmental activities in the scheme area.
- 9) **Compensation:** The owner of any property or right which is injuriously affected by the making of a TPS shall, subject to provisions of Section 101, if he makes a claim before the Arbitrator within sixty days of the receipt of the notice from the Arbitrator, be entitled to obtain compensation in respect thereof from the Planning Authority or from any person benefited or partly from the Planning Authority and partly from such person as the Arbitrator may in each case determine.

## IMPACT OF TOWN PLANNING SCHEME INTERVENTION ON LAND VALUES

Various TPSs have been implemented in the State of Maharashtra till date. Out of which TPS No. 4 and 5 from Kolhapur City and TPS No. 1 and 2 from Ratnagiri Town have been selected to study impact of TPS intervention on land values. Implementations of these schemes from date of Declaration of Intention up to sanction to Final Scheme by the government have been studied in details. Stage wise chronological details of these schemes are presented in following Table No.1. Sanctioned layouts of TPSs selected for study are presented in following Figure 1. Actual site visits have been carried out to analyze extent of development in jurisdiction of these selected TPSs. About ten Final Plots from Residential Land Use from each TPS have been identified based on their development potential. Actual Market Rates of these plots have been collected from respective Sub-Registrar Office based on registrations of sales transactions of these plots. Selections of these plots are governed by availability of their registrations of sales transactions and period taken for development of proposed infrastructure and amenities / facilities in respective TPS jurisdiction. This period is about ten years for TPS No. 4 and 5, whereas, it is about five years for TPS No. 1 and 2.

Table No. 1: Stage Wise Preparation Details of Selected Town Planning Schemes

| Sr. No. | Description of Stages in Preparation of TPS | Stage Wise Preparation Date Details |            |            |            |
|---------|---|-------------------------------------|------------|------------|------------|
|         |   | TPS-4                               | TPS-5      | TPS-1      | TPS-2      |
| 1       | Area of Town Planning Scheme                | 35.61 Ha.                           | 46.60 Ha.  | 78.54 Ha   | 46 Ha.     |
| 2       | Date of Declaration of Intention            | 30/07/1971                          | 30/07/1971 | 29/03/1976 | 29/03/1976 |
| 3       | Publication of Draft Scheme                 | 20/01/1973                          | 17/07/1974 | 22/09/1977 | 21/04/1979 |
| 4       | Sanction of Draft Scheme                    | 10/10/1974                          | 28/05/1975 | 06/05/1981 | 25/03/1981 |
| 5       | Appointment of Arbitrator                   | 10/10/1974                          | 28/05/1975 | 06/05/1981 | 25/03/1981 |
| 6       | Constitution of Tribunal of Appeal          | 31/07/1989                          | 31/07/1989 | 06/08/2010 | 06/08/2010 |
| 7       | Submission to Government for Sanction       | 10/12/1990                          | 13/06/1990 | 15/12/2016 | 16/12/2016 |
| 8       | Revision of Scheme                          | 06/01/2000                          | NA         | 07/01/2017 | NA         |
| 9       | Submission of Revised Scheme                | 25/06/2001                          | NA         | 26/02/2017 | NA         |
| 10      | Sanction to Final Scheme by Government      | 21/02/2007                          | 27/11/1990 | 20/04/2017 | 20/04/2017 |
| 11      | Final Scheme in to Effect                   | 15/04/2007                          | 08/01/1991 | 20/05/2017 | 20/05/2017 |

Source: Town Planning Scheme Reports, Directorate of Town Planning and Valuation, Pune

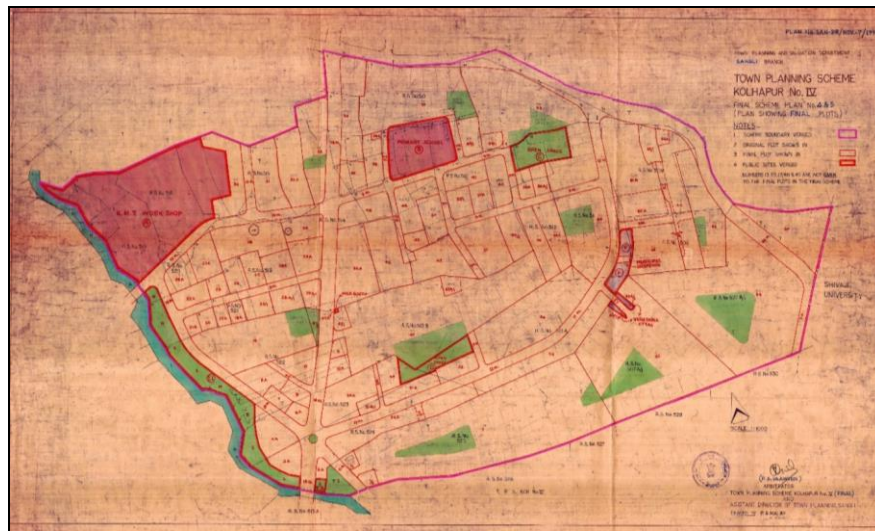
Analysis of Semi-Final Plot Rates, Final Plot Rates collected from Redistribution and Valuation Statement and Actual Market Rates collected from Sub-Registrar Office for selected plots have been carried out. Vast amount of variations have been observed in Final Plot Rates and Actual Market Rates for all plots selected from these TPSs. Percentage variations in these rates are quite higher showing impact of TPS intervention on land values. Parameters resulting into higher Market Rates of Final Plots have been identified based on sanction layout of TPS and actual site visit conducted. Details available in Redistribution and Valuation Statements of each TPS and from Sub-Registrar Office pertaining to these plots are presented in following Table No. 2 and 3. Valuation of Final Plots by the Arbitrator on lower side has resulted into low amount of Incremental Value and subsequently, resulted into lower Incremental Contribution. It is further observed that valuation of Final Plots having similar parameter/s is varying considerably across all selected TPSs. Subjectivity and perspective of individual Arbitrator are mainly responsible for this. Various parameters contributing in higher Market Rates for each Final Plots are listed down and presented in above mentioned tables. Mainly these parameters include Road Frontage, Depth of Plot and Availability of Social Amenities and Facilities within certain distance. Therefore, rationalization of process of arriving at valuation of Final Plots is necessary to avoid under valuation of potential lands in jurisdiction of TPS.

#### RATIONALIZATION OF VALUATION OF FINAL PLOTS IN TOWN PLANNING SCHEME

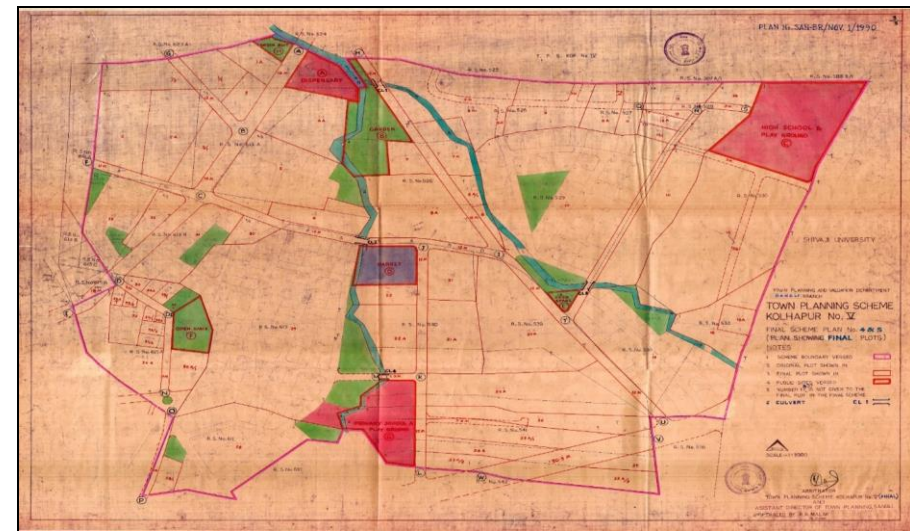
Rationalization means organizing something into a logical coherent system which is a cognitive process of making something seem consistent with or based on reason (Rationalization, 1998-2020). The coherent system needed for the projection of Final Plot Rate is a cause of concern due to its effect on the Incremental Contribution as studied in the earlier paragraph. The methodology with logical reasoning is required so that the values as on the date of declaration of intention considering the average Inflation Rate can be taken-up to project the Final Plot Rate. Accordingly, parameters identified above, such as, Road Frontage, Depth of Plot and Availability of Social Amenities and Facilities within certain distance have been considered for rationalization of valuation of Final Plots. These identified parameters further subdivided into sub-parameters and their attributes to rationalize their impact on valuation of Final Plots. Road Frontage is further subdivided into One Side Road Frontage Plot and Corner Plot. Road Frontage is further sub-divided based on varying road widths. Depth of Plot is also sub-divided based Long Side Frontage and Short Side Frontage. Social Amenities and Facilities considered for rationalization includes School, Hospital, Playground, Commercial Centre, Garden / Park, Hill Side Land and Slums. Impact of availability of Social Amenities and Facilities is governed by their type and distance from the Final Plot in the jurisdiction of TPS. Influential distance is subjective term and may vary according to use, size and location of Social Amenities and Facilities in the jurisdiction of TPS. Parameters and sub-parameters with their attributes considered for rationalization of valuation of Final Plot are presented in following Figure 2. Analytical Hierarchy Process has been employed for computations of relative importance and ranking of these identified parameters and sub-parameters with their attributes.

#### ANALYTIC HIERARCHY PROCESS

Analytic Hierarchy Process (AHP) is one of the Multi Criteria Decision Making methods, which has many advantages, as well as disadvantages. One of its advantages is its ease of use. Its use of pair-wise comparisons can allow decision makers to weight coefficients and compare alternatives with relative ease.



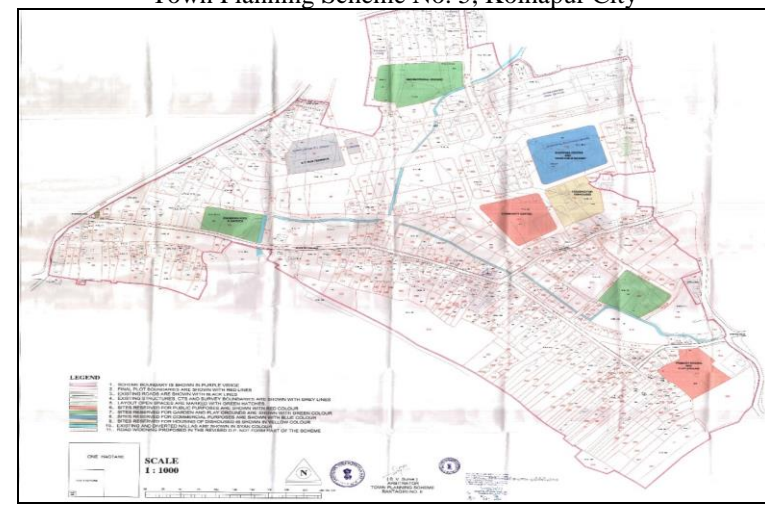
Town Planning Scheme No. 4, Kolhapur City



Town Planning Scheme No. 5, Kolhapur City



Town Planning Scheme No. 1, Ratnagiri Town



Town Planning Scheme No. 2, Ratnagiri Town

Source: Town Planning Scheme Reports, Directorate of Town Planning and Valuation, Pune

Figure No. 1: Sanctioned Layouts of Town Planning Schemes Selected for Case Studies

Table No. 2: Escalation in Land Values of Final Plots due to Impact of Town Planning Scheme Intervention (Rate ₹/ sq. mt.)

| Sr. No.  | Original Plot No. | Final Plot No. | Original Plot Rate | Final Plot Rate | Increase in Rate per cent | Actual Market Rate | Year of Purchase | Actual Increase in Rate per cent | Reason for Escalation                               |
|--|-------------------|----------------|--------------------|-----------------|---------------------------|--------------------|------------------|----------------------------------|---|
| <b>Town Planning Scheme (TPS) No. 4, Kolhapur City</b> |                   |                |                    |                 |                           |                    |                  |                                  |   |
| 1  | 2                 | 3              | 2.50               | 3.10            | 24.00                     | 13.30              | 1982             | 432.00                           | Corner Plot with adjoining Green Belt               |
| 2  | 10                | 18             | 2.45               | 3.20            | 30.61                     | 20.50              | 1984             | 736.73                           | One Side Road Frontage and Open Space               |
| 3  | 21                | 25/1           | 4.00               | 4.60            | 15.00                     | 13.00              | 1981             | 225.00                           | Short Side on One Side Road Frontage                |
| 4  | 32/1              | 26A            | 3.00               | 3.50            | 16.67                     | 20.53              | 1984             | 584.30                           | Corner Plot near Green Belt                         |
| 5  | 10/1              | 29             | 2.60               | 4.00            | 53.84                     | 18.85              | 1983             | 625.00                           | Corner Plot with short side on 12 mt. Wide Road     |
| 6  | 27                | 30             | 3.00               | 3.90            | 30.00                     | 15.20              | 1982             | 406.60                           | Corner Plot adjoining K.M.T. Workshop               |
| 7  | 37                | 38             | 2.90               | 4.20            | 44.80                     | 22.84              | 1984             | 687.50                           | Corner Plot in front of Primary School              |
| 8  | 41                | 41             | 2.75               | 3.80            | 38.20                     | 23.65              | 1984             | 760.00                           | Corner Plot in front of Primary School              |
| 9  | 50                | 53             | 3.30               | 4.10            | 24.30                     | 17.50              | 1982             | 430.30                           | Corner Plot adjoining Open Space                    |
| 10   | 46A               | 58A            | 2.80               | 3.80            | 35.70                     | 12.20              | 1981             | 335.71                           | Corner Plot adjoining Open Space                    |
| <b>Town Planning Scheme (TPS) No. 5, Kolhapur City</b> |                   |                |                    |                 |                           |                    |                  |                                  |   |
| 1  | 1                 | 1A             | 2.50               | 3.20            | 28.00                     | 13.85              | 1982             | 454.00                           | One Side Road Frontage adjoining Green Belt         |
| 2  | 2                 | 2              | 2.70               | 3.50            | 29.60                     | 14.20              | 1982             | 425.90                           | One Side Frontage with short side on 12 mt. Road    |
| 3  | 3                 | 3/1            | 2.70               | 3.70            | 37.10                     | 17.70              | 1983             | 555.50                           | Corner Plot with roads on three sides               |
| 4  | 3A                | 4A             | 2.70               | 3.70            | 37.10                     | 17.57              | 1984             | 550.74                           | One Side Road Frontage adjoining Garden.            |
| 5  | 28                | 6              | 2.50               | 3.80            | 52.00                     | 17.00              | 1984             | 580.00                           | Short side road frontage, long side Market Frontage |
| 6  | 6                 | 7              | 2.75               | 3.40            | 23.60                     | 19.84              | 1984             | 621.40                           | One Side Road Frontage adjoining Garden             |
| 7  | 11                | 14             | 3.20               | 3.90            | 21.90                     | 24.65              | 1986             | 670.30                           | Corner Plot adjoining High School                   |
| 8  | 12                | 16             | 3.20               | 3.80            | 18.80                     | 26.20              | 1986             | 718.70                           | Corner Plot adjoining High School                   |
| 9  | 14                | 19             | 3.00               | 3.70            | 23.30                     | 23.35              | 1985             | 678.30                           | Corner Plot in front of Open Space                  |
| 10   | 16/1              | 21             | 2.90               | 3.70            | 27.60                     | 20.21              | 1984             | 596.60                           | Corner Plot in front of Market                      |

Source: Redistribution and Valuation Statement, Town Planning Scheme No. 4 and 5, and Sub-Registrar, Kolhapur City

Table No. 3: Escalation in Land Values of Final Plots due to Impact of Town Planning Scheme Intervention (Rate ₹/ sq. mt.)

| Sr. No.   | Original Plot No. | Final Plot No. | Original Plot Rate | Final Plot Rate | Increase in Rate per cent | Actual Market Rate | Year of Purchase | Actual Increase in Rate per cent | Reason for Escalation                             |
|---|-------------------|----------------|--------------------|-----------------|---------------------------|--------------------|------------------|----------------------------------|---|
| <b>Town Planning Scheme (TPS) No. 1, Ratnagiri Town</b> |                   |                |                    |                 |                           |                    |                  |                                  |   |
| 1   | 1                 | 1              | 12.00              | 15.00           | 25.00                     | 31.71              | 1983             | 164.25                           | One Side Road Frontage of 24.38 mt. Wide Road     |
| 2   | 6/3               | 6/3            | 10.00              | 13.00           | 30.00                     | 34.15              | 1983             | 241.50                           | Corner Plot adjoining Open Space                  |
| 3   | 7                 | 7              | 12.50              | 18.00           | 44.00                     | 35.20              | 1984             | 181.60                           | Corner Plot on Highway frontage                   |
| 4   | 37A               | 37A            | 13.00              | 18.00           | 38.50                     | 35.15              | 1984             | 170.40                           | One Side Road Frontage adjoining S.T. Workshop    |
| 5   | 41/6              | 41/6           | 11.50              | 16.00           | 39.10                     | 36.50              | 1984             | 217.40                           | Corner Plot having short side facing Major Road   |
| 6   | 57                | 58             | 9.00               | 16.00           | 77.80                     | 41.00              | 1986             | 355.50                           | Corner Plot near Thiba Palace                     |
| 7   | 59/7              | 71/A1          | 8.00               | 14.00           | 75.00                     | 53.75              | 1987             | 571.90                           | Corner Plot in front of Garden                    |
| 8   | 83/A              | 88/A           | 9.00               | 14.00           | 55.50                     | 44.30              | 1985             | 392.22                           | Corner Plot on rear side of Garden                |
| 9   | 86                | 93             | 10.50              | 14.00           | 33.30                     | 46.55              | 1985             | 343.30                           | One Side Road Frontage in front of Open Space     |
| 10  | 93                | 99             | 14.00              | 15.00           | 7.10                      | 54.70              | 1986             | 290.71                           | One Side Road Frontage in front of Stadium        |
| <b>Town Planning Scheme (TPS) No. 2, Ratnagiri Town</b> |                   |                |                    |                 |                           |                    |                  |                                  |   |
| 1   | 1                 | 2/A            | 6.00               | 15.00           | 150.00                    | 25.50              | 1983             | 325.00                           | One side road frontage facing Recreational Ground |
| 2   | 1                 | 3/A            | 6.00               | 15.00           | 150.00                    | 24.25              | 1983             | 304.10                           | Corner Plot near Recreational Ground              |
| 3   | 19A               | 28             | 3.00               | 18.00           | 500.00                    | 23.20              | 1984             | 673.30                           | Corner Plot near Recreational Ground              |
| 4   | 38                | 48             | 12.00              | 17.00           | 41.70                     | 32.70              | 1983             | 172.50                           | One Side Road Frontage                            |
| 5   | 118               | 102            | 3.00               | 16.00           | 433.30                    | 23.90              | 1985             | 696.60                           | One Side Road Frontage near Swimming Pool         |
| 6   | 73                | 83             | 8.00               | 12.00           | 50.00                     | 25.55              | 1984             | 219.37                           | One Side Road Frontage in front of Swimming Pool  |
| 7   | 20                | 97             | 3.00               | 18.00           | 500.00                    | 28.40              | 1985             | 846.60                           | One Side Road Frontage in front of Bus Terminus   |
| 8   | 134               | 108            | 3.50               | 20.00           | 471.40                    | 35.70              | 1985             | 920.00                           | Corner Plot in front of Shopping Center           |
| 9   | 115               | 117            | 3.00               | 15.00           | 400.00                    | 25.40              | 1983             | 746.60                           | One Side Road Frontage                            |
| 10  | 148               | 150            | 3.00               | 15.00           | 400.00                    | 27.20              | 1984             | 806.60                           | Corner Plot in front of Community Center          |

Source: Redistribution and Valuation Statement, Town Planning Scheme No. 1 and 2, and Sub-Registrar, Ratnagiri Town

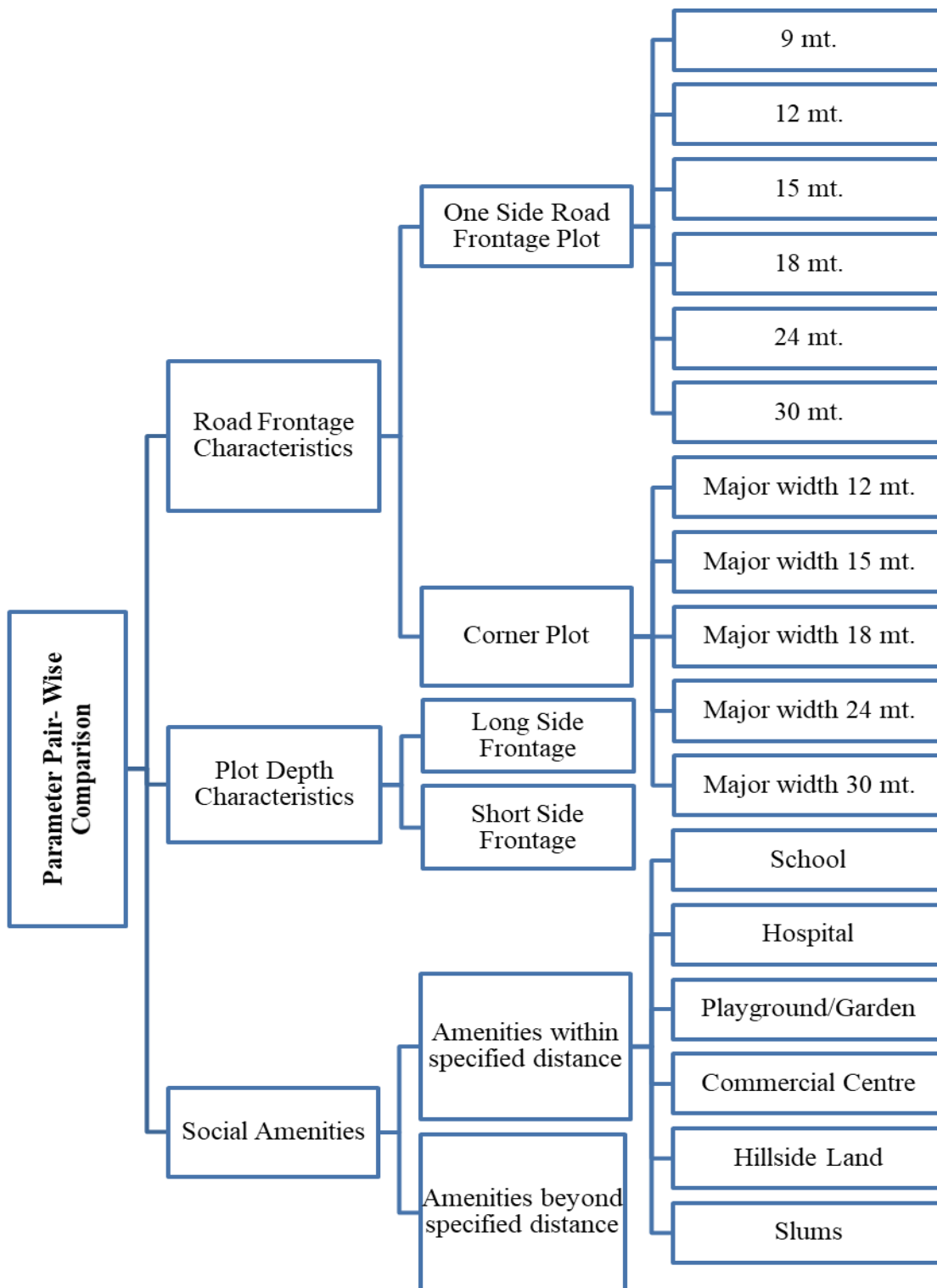


Figure No.2: Parameters and Sub-Parameters with their Attributes Selected for Pair-Wise Comparison in Analytic Hierarchy Process

It is scalable and can easily adjust in size to accommodate decision making problems due to its hierarchical structure. AHP method is used for pair-wise comparisons, which are used for both to compare the alternatives with respect to the various parameters and to estimate weightage of these parameters. AHP is a theory of measurement through pair-wise comparisons and relies on the judgments of decision makers to derive priority scales. In short, it is a method to derive Ratio Scales from paired comparisons. The input can be obtained from actual measurement, such as, price, weight etc., or from subjective opinion, such as, satisfaction, feelings and preference. AHP allow some small inconsistency in judgment because human is not always consistent. The Ratio Scales are derived from the Principal Eigen Vectors and the Consistency Index is derived from the

Principal Eigen Value. By reducing complex decisions to a series of pair-wise comparisons, and then synthesizing the results, the AHP helps to capture both subjective and objective aspects of a decision. In addition, the AHP incorporates a useful technique for checking the consistency of the decision maker's evaluations, thus reducing the biasness in the decision-making process. The method has experienced problems of interdependence between parameters and sub-parameters. Due to the approach of pair-wise comparisons, it can also be assist on inconsistencies in judgment and ranking of parameter and it does not allow decision maker to grade one parameter in isolation, but in comparison with the rest, without identifying weaknesses and strengths. AHP transforms the comparisons, which are most often empirical, into numerical values that are further processed and compared. The weight of each factor allows the assessment of each one of the elements inside the defined hierarchy.

The AHP considers a set of evaluation parameter, and a set of alternative options among which the best decision is to be made. It is important to note that, since some of the parameters could be contrasting, it is not true in general that the best option is the one which optimizes each single parameter, rather the one which achieves the most suitable trade-off among the different parameters. The AHP is a very flexible and powerful tool because the scores; and therefore, the final ranking, are obtained based on the pair-wise relative comparison of both the parameter and the options provided by the decision maker. The computations made by the AHP are always guided by the decision maker's experience, and the AHP can thus be considered as a tool that is able to translate the evaluations (both qualitative and quantitative) made by the decision maker into a multi-parameter ranking. In addition, the AHP is simple because there is no need of building a complex expert system with the decision maker's knowledge embedded in it. The AHP may require many evaluations by the decision makers, especially for problems with many parameter and sub-parameters. Although every single comparison is very simple, since it only requires the decision maker to express how two options or parameters compare to each other, the load of the evaluation task may become unreasonable. In fact, the number of pair-wise comparisons grows quadratically with the number of parameters and sub-parameters.

#### ANALYZING IMPACT OF TOWN PLANNING SCHEME INTERVENTION ON LAND VALUES

Expert Opinion survey has been conducted for working out the weightages of various parameters and sub-parameters with their attributes affecting land value. Parameters and sub-parameters with their attributes as presented in Figure 1 have been used for the pair-wise comparison through Expert Opinion Survey. Experts have been identified from Town Planning and Valuation Department, Government of Maharashtra having professional experience more than 20 years and had dealt with preparation of TPS. The methodology followed above and steps to be followed in survey are explained to the identified experts. The weightages are assigned in the AHP Framework by the experts based on the pair-wise relative comparison of parameters and sub-parameters with their attributes. The comparisons made by the AHP are always guided by the decision maker's knowledge, experience, intuition and understanding of Market Forces. Thus, the weightages indicate the perception about various parameters and sub-parameters in the normative form. The weightages assigned by the experts have been converted into their Multiplicative Indices (MI) for its conversion from Original Plot Rate to Final Plot Rate. The Multiplicative Indices for each parameter and sub-parameters with their attributes are presented in following Table No.4.

Table No. 4: Final Plot Potential Weightages and Multiplicative Indices (MI)

| Sr. No.  | Parameter / Sub-Parameter     | Weight-age % | Parameter / Sub-Parameter | Weight-age % | Parameter / Sub-Parameter                   | Weight-age % |
|----------|-------------------------------|--------------|---------------------------|--------------|---|--------------|
| 1        | Road Frontage                 | 19.1         | Plot Depth                | 36.2         | Availability of Social Amenity and Facility | 44.7         |
| 2        | One Side Road Frontage        | 69.8         | Long Side Frontage        | 49.3         | Within Specific Distance                    | 68.5         |
| 3        | Corner Plot                   | 30.2         | Short Side Frontage       | 50.7         | Beyond Specific Distance                    | 31.5         |
|          | <b>Sub Parameter</b>          | <b>MI</b>    | <b>Sub Parameter</b>      | <b>MI</b>    | <b>Sub Parameter</b>                        | <b>MI</b>    |
| 1        | One Side Road Frontage        | 0.133        | Long Side Frontage        | 0.178        | Within Specific Distance                    | 0.306        |
| 2        | Corner Plot                   | 0.057        | Short Side Frontage       | 0.182        | Beyond Specific Distance                    | 0.140        |
|          | <b>Attributes</b>             | <b>MI</b>    | <b>Attributes</b>         | <b>MI</b>    | <b>Attributes</b>                           | <b>MI</b>    |
| <b>1</b> | <b>One Side Road Frontage</b> |              |                           |              | <b>Within Specific Distance</b>             |              |
| a)       | Road Width 9 mt.              | 0.029        |                           |              | School                                      | 0.083        |
| b)       | Road Width 12 mt.             | 0.038        |                           |              | Playground / Garden                         | 0.084        |
| c)       | Road Width 15 mt.             | 0.023        |                           |              | Commercial Center                           | 0.051        |
| d)       | Road Width 18 mt.             | 0.018        |                           |              | Slums                                       | 0.014        |
| e)       | Road Width 24 mt.             | 0.012        |                           |              | Hospital                                    | 0.042        |
| f)       | Road Width 30 mt.             | 0.011        |                           |              | Hill Side Land                              | 0.028        |
| <b>2</b> | <b>Corner Plot</b>            |              |                           |              | <b>Beyond Specific Distance</b>             |              |
| a)       | Road Width 12 mt.             | 0.019        |                           |              | School                                      | 0.026        |
| b)       | Road Width 15 mt.             | 0.016        |                           |              | Playground / Garden                         | 0.020        |
| c)       | Road Width 18 mt.             | 0.010        |                           |              | Commercial Center                           | 0.036        |
| d)       | Road Width 24 mt.             | 0.006        |                           |              | Slums                                       | 0.014        |
| e)       | Road Width 30 mt.             | 0.003        |                           |              | Hospital                                    | 0.030        |
| f)       |                               |              |                           |              | Hill Side Land                              | 0.012        |



Pair-wise comparative analysis using AHP have given extent of impact on valuation of Final Plots and relative importance of various identified parameters and sub-parameters with their attributes. Availability of Social Amenities and Facilities has shown higher impact on valuation of Final Plot than Road Frontage and Plot Depth. Further, Plot Depth has shown higher impact than Road Frontage on valuation of Final Plot. One Side Road Frontage has shown higher impact than Corner Plot on valuation of Final Plot. Impact of One Side Road Frontage and Corner Plot have shown decreasing trend with respect to increase in Road Width. However, it has shown higher impact for One Side Road Frontage Plot and Corner Plot facing 12 mt. wide road. In case of Plot Depth, Short Side Frontage has shown higher impact on valuation of Final Plot than Long Side Frontage Plot. Availability of Social Amenities and Facilities within specific distance has shown higher impact on valuation of Final Plot than their availability beyond specific distance. Type of Social Amenity and Facility has shown varying impact on valuation of Final Plot and their impact has shown decreasing trend with increase in distance from Final Plot. Impact of Social Amenity and Facility on valuation of Final Plot is governed by its use, scale and distance. Availability of School and Playground within specific distance from Final Plot has shown higher impact on valuation of Final Plot than other Social Amenities and Facilities.

### CONCLUSION

Intervention of Town Planning Scheme has significant impact on valuation of Final Plots because of orderly development, provision of infrastructure and availability of Social Amenities and Facilities. Intervention of Town Planning Scheme, in the form of Road Frontage, Plot Depth and Availability of Social Amenities and Facilities within certain distance is having varying impact on valuation of Final Plot. Valuation of Final Plot is very subjective in nature and is mainly governed by the perspective of the individual Arbitrator. Subjectivity and perspective of individual Arbitrator are governed by knowledge, experience, intuition and understanding of Market Forces. It is difficult to address this kind of subjectivity and individual perspective totally in arriving at valuation of Final Plot. However, process of arriving at valuation of Final Plot can be rationalized using pair-wise comparative analysis in AHP Method. Generalized guidelines based on pair-wise comparative analysis of parameters and sub-parameters with their attributes are helpful to rationalize the valuation process of Final Plot in TPS. These generalized guidelines are also helpful to address subjectivity and individual perspective of Arbitrator in valuation process. However, impact of these parameter and sub-parameters with their attributes on valuation of Final Plot is context specific and likely to change with time. Further, various combinations of parameters and sub-parameters with their attributes are likely to have varying impact on valuation of Final Plot.

### BIBLIOGRAPHY AND REFERENCES

1. Ahluwalia Isher Judge, P. K. Mohanty, "Unlocking Land Value for Financing Urban Development in India", ICRIER Journal, Annual Report 2014-15.
2. Arbitrator, Town Planning Department (1974,1975,1981), "Report of Town Planning Scheme Kolhapur No. 4 and 5, Town Planning Scheme Ratnagiri No. 1 and 2", Directorate of Town Planning, Pune.
3. Ballaney Shirley, "Making Urban Planning Work: The Town Planning Scheme Mechanism in Gujarat, India", the Journal on Urban Planning by World Bank Institute.
4. Bunyan Unel, F., & Yalpir, S. "Valuations of building plots using the AHP method.", International Journal of Strategic Property Management, 23(3), pg. 197-212(2019).
5. Chen, J. (2019), *What Is Land Value?* Retrieved from <https://www.investopedia.com/terms/l/landvalue.asp#:~:text=Land%20values%20increase%20when%20demand,be%20found%20on%20the%20land>.
6. Government of Maharashtra, Town Planning Scheme (2015). "Maharashtra Regional and Town Planning Act 1966", Government Central Press, Mumbai, G.N.U.D.P.H & H.D. No. TPA.1070/13771-W-II, 05<sup>th</sup> November 2015.
7. Espino Daniel Jato, Lopez Elina Castillo, "A Review of Application of Multi-parameter Decision Making Methods in Construction", Elsevier Journal, Automation in Construction 45 (2014) pg. 151-162.
8. Ong, S. E., & Chew, T. I., Singapore residential market: an expert judgmental forecast incorporating the analytical hierarchy process. Journal of Property Valuation and Investment, 14(1), pg. 50-66 (1996).
9. Patela Jignesh K., Dr. Macwan J.E.M, "Innovative Methods to Practice Town planning Scheme for supply of Urban Land in India", International Journal of Innovative and Emerging Research in Engineering Volume 2, Issue 6, 2015.
10. *Rationalisation* - Text from Vocabulary.com (<https://www.vocabulary.com>), C. ©.-2. (1998-2020), Retrieved July 2, 2020
11. Saaty Thomas L., "Decision making with Analytical Hierarchy Process", International Journal of Services and Science, Vol. 1, No. 1 (2008), pg. 83-98.
12. Sub Registrar, "Sales Transactions of lands in Kolhapur and Ratnagiri", Sub Registrar Office Karvir and Rahatghar.
13. Velasquez Mark, Hester Patrick, "An Analysis of Multi-Criteria Decision-Making Method "Analytical Hierarchy Process(AHP)", International Journal of Operations Research Vol. 10, No. 2, pg. 56-66 (2013).