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A MATHEMATICAL ASPECT OF FOREST GROWTH

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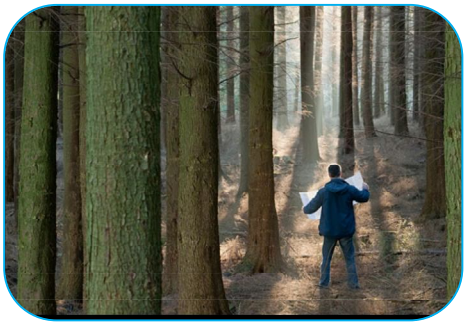
ABSTRACT

Presented herein are the studies of growth of forest. The ideal model is to produce the result consistent with those in normal situation. It has been observed that the growth rate of forest depend upon two parameter G and D. It has been observed that the forest increases with the increase the value of G and decrease the value of D.



KEY WORDS: - *Forest management, growth rate, decline tree, growing tree, shifting tree.*

INTRODUCTION:

Forest constitutes the largest, complex and most important natural resources, most dominated by trees, the diversity and sizes of which vary in different parts of world. About one third of the earth's land area is covered with forest and nearly 50% of the total forest land is tropical forest. India and other tropical countries have particularly abundant timer and hard wood resources. Timber accounts for twenty five percentage of all photosynthetic materials produced on the earth and about half of total biomass produced.

Forests provide the direct benefits in the way of product.It has many indirect beneficial influences which are often overlooked. It includes the effects of forests on climate soil and water which is the basics of life. It refers to the evaluation, estimation, prediction of forest. It is performed by carrying out intensive forest inventory. Forest resources assessment has two values measuring the quality and quantity of resources and economic feasibility of utilizing.

Forest management is the process of organizing forest stands. They produce a continuous stream of whatever resources are desired from that forest. The production of resources is to facilitate from the forest in a manner that ensure that they will be fore ever available. The management techniques for accomplishing these purposes vary from extraordinary simple to the exceedingly complex.

The most celebrated principle of forest management all over the world is sustained yield. This was replaced by the principle of increasing yield in the recent past. But the new concept covers only those forests which are in the early stages of their development. Forest management is an integration of

silvicultural systems, protection, economics etc. Each of which is a separate subject of forest management. The normal forest, management unit's, rotation, increment, yield calculation and serves as a tool for establishing sustained yield forest management plans.

A normal forest is an ideal forest condition which serves as standard for comparison of an actual estate. The deficiencies of the latter are brought out for purposed of sustained yield management. Normal forest has an ideal growing stock, an ideal distribution of age classes of the component crop and putting on an ideal increment. Forest annual yields equal to increment can be realized indefinitely, without endangering future yields. Normal forest is a conception of forest management based on the principle of substained yields. A normal forest is an ideally constituted forest with such volumes of trees of various ages so distributed and growing in such a way that they produce equal annual volumes of the produce.

Forest is a capital in the economic sense, which should produce interest. Increment is the increase in growth of a tree or crop with age. It may be in terms of wood content or any of the factors which increase with age diameter height basal area, volume quality. The term increment refers usually the only volume increment. Agrawal and Mishra[2] discussed the impacts on growth the plant has yet not been taken in account. Sharma and Kesarker[3] discussed the impact of forest on climate. Chaudhary R.[1] discussed the growth of forest. Yadav A.K. and Chaudhary R[4] said that the expression of density depends on the utilization of forest.

A mathematical model has been developed to help us to understand forest growth.

FORMULATION OF THE PROBLEM

The bearing model considered for the present analysis of forest growth.
Let N(b) be the growth of the forest at time t, then the growth rate is

$\frac{dN}{dt}$ =Growingtrees–declinetree+shifting trees (1)

The form of the various terms on the right hand side of equation (1) necessitates modeling the situation that are connected with. The simplest model has no shifting tree and growing and decline tree terms are proportional to N. Then, we have;

$$\frac{dN}{dt} = GN - DN \quad (2)$$

$$\frac{dN}{dt} = N(G - D) \quad (3)$$

With boundary condition,

$N = N.$ at $t = 0$ (4)

SOLUTION OF THE PROBLEM

Integrating equation (3), we get

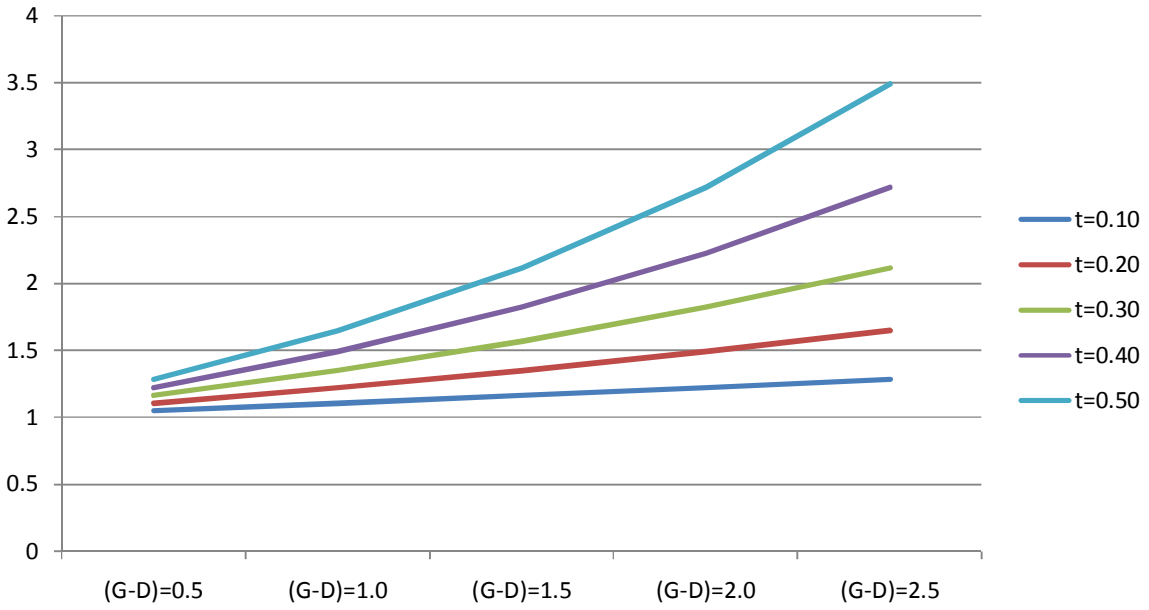
$$\log N = (G - D)t + A \quad (5)$$

Where A is constant of integration
Using the boundary condition (4), we get

$N = N\square\ e^{(G-D)t}$

RESULT AND DISCUSSION

The present paper proposes a more realistic model for explaining the forest growth. The result of growth of forest has been examined for different value of parameter G, D and t. It is clear that if G > D the growth of forest increasing with time.



Variation of Growth of forest at N_0= 1, Graph between N and (G-D)

REFERENCE

1. Chaudhary R. (2000): "A study of growth of forest in Guna district" Ind. Jr. App. Sci periodical vol.II page no. p 10-13
2. Agrawal M. and Mishra N. (2001): A model for a forest grass land effect of overgrazing and pollution. Ind. Jr. pure App. Math p 613-628
3. Sharma K.C. and Kesarkar A.P.(2001): The impact of climates change , national seminar mathematical modeling to the application of physiological system and environmental pollution p 12-20
4. Yadav A.K. and Chaudhary R. (2007): Mathematical analysis of an alternative to tropical forest. National seminar on comprehensiveness of mathematics p 66-70

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