RETURN FROM STANDING TIMBER IN PROJECT—EVALUATION ANALYSIS OF MAHARASHTRA PROJECT—FURTHER COMMENTS

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Mishra (1971) has objected to the inclusion of revenue from clearfelling of existing forest, as project benefit and has argued that this revenue should be taken in the cost stream as borrowed loan and the benefit stream of the project should be suitably modified to take in to account the capitalised value of the forests, obtained as lease, by the Project Authority.

Sathe & Susaeta (1973) have argued for the inclusion of the return from clearfelling of "God given stand" as project benefit on the ground that "it materialises because of the project".

The divergence in these view-points can be explained, if the basic object behind the establishment of the Project Authority is analysed. If the Project Authority is viewed solely as an agency entrusted with the work of raising plantations on bare ground transferred to it by the Forest Department, then perhaps, the views of Mishra are acceptable, with the provision that the methodology of benefit cost analysis would have to be modified as discussed below. If the Project Authority is viewed as an agency responsible both for exploitation of forests as well as raising of plantations on clearfelled areas, then the economic analysis as carried out by Sathe & Susaeta (1973) appears to be correct for the simple reason that all the project benefits including revenue due to clearfelling of existing stand flow because of the project. The Forest Department had the option exploiting these resources in an optimal manner consistent with its objectives and presumably it was exercising this option and getting an average return of Rs. 15/-per ha from these areas [page 126 of Project report by Sath and Susaeta (1973)]. The underlying assumption here is that this was the best posssible alternative open to the Forest Department, under its institutional and budgetary constraints. Therefore, the opportunity cost of the land and growing stock is repre-sented by the capitalised value of an annuity payment of Rs. 15/-per ha at the 'going' market rate of interest. Since the forests contemplated for transfer to Project Authority comprise of uneven aged stand, worked on selection cum improvement silvicultural system, Davis (1966) points out that "a land value never exists separately from timber value unless the stand is cut, in which case there is no longer any uneven aged stand. Land and timber necessarily go together," Under such circumstances, the capital value of these forests, as per the formula given by Davis (1966) is

$$Vo = \frac{Yc}{(1+i)^t - 1} - \frac{e}{i}$$

where

Vo = Capital value

Yc = Yield per cutting cycle (net stumpage value)

e = annual expenses

i = rate of interest.

If the present worth of summation of the payment of annual lease rental of Rs. 15/- per ha as calculated in the project spread over a time span of 50 years of the project and appropriately discounted, amounts to Vo, then the Project Authority is positively entitled to reap the benefits of the god given stand and include it in the project benefits in its entirety, without any qualms of conscience.   Mathur's (1971) estimation of a higher capitalised value of god given stand, by using a risk free rate of interest of $2\frac{1}{2}$ % is erroneous; for nobody would loan any capital, even to Government for a period of 50 years at this rate of interest.   Recently the Government of India have floated 2 loans aggregating in value to Rs. 275 crores (Times of India dated 6. 10. 76).   The maturity period of one loan is 1993 at 6% (issued at 99.25%) and the other loan matures in the year 2002 at the rate of $6\frac{1}{2}$% (issued at par).   It would therefore be quite illogical to use any rate of interest lower than this.

Further, supposing the forest department were to auction this piece of property, the government reserve price of which was fixed at the Mathur's estimation of its capitalised value at $2\frac{1}{2}$% and if this property was yielding only an annual income of Rs.15/- per ha annually under all the attendent risk of damage and destruction due to fire, illicit cutting, excessive grazing, insect damage and drought, it would hardly be able to find a customer, who would be willing to pay Rs. 600/- per ha for this property.   It would therefore be unreasonable to expect the Project Authorities to pay this amount in the form of increased rental payment.   Besides, if the Forest Department had an opportunity cost of these resources beyond Rs. 15/-per ha under its institutional and budgetary constraints, it would certainly seize on these opportunities instead of transferring the resources to Project Authoritiy.   The forest department has minimised its risks by transferring these resources in consideration of receiving from the Project Authority, a compensation equal to its capitalised value and cannot claim any higher compensation than this   In this transaction the forest department has assured itself of a risk free income equal to the present opportunity cost of resources transferred and also a growing stock which will have appreciated in value from Rs. 187.50 p/ha to Rs. 1830/ha in course of 50 years, using a discount rate of 8% and as per the calculations done in the project analysis [Table 34, page 93 of report by Sathe and Susaeta (1973)].

The use of appropriate interest rate in this analysis is again a matter of considerable importance.   While considerable literature in economics exists on the interest rate to be used for public investment decisions, [Marglin (1963), Feldstein (1964), Sen (1967), Baumol (1968), Herberger (1969)], none of these give a cut and dried answer to the question of the rate of interest to be charged in discounting the benefits and costs of forestry projects to a common time period.   A rough and ready guide for this is to use the same rate of interest on which the Project Authority would borrow funds for meeting its investment needs.   Most of the Forest Development Corporations that have been established in this country take recourse to borrowing funds from commercial banks at $9\frac{1}{2}$ percent which in turn get reimbursed to the extent of the loan advanced, from the funds of Agricultural Refinance Corporation, at $7\frac{1}{2}$% rate of interest.   Therefore, it would quite be in order to use $9\frac{1}{2}$% rate of interest for discounting of all costs estimated in the project.

In the benefit stream, all the nonmarket benefits like availability of raw material in concentrated areas after the plantations are established, the additional job opportunities that the project would create, the improvements in infrastructure due to the project, forest recreation due the project, etc. cannot be properly evaluated. On the other hand, the external diseconomies like those associated with monoculture e g. the likely deterioration in soil texture under pure plantations of teak, the increased risks and susceptibility of pure plantations to insect and fungal attack etc. also cannot be estimated. So also, the weighage factor to be assigned to various costs and benefits for the risks and uncertainties involved in creation of the plantations by the Project Authority cannot be meaningfully determined. The case of external nonmarket benefits from the project would warrant discounting of benefit stream at a lower rate of discount that $9\frac{1}{2}\%$, since many of these nonmarket benefits cannot be quantified and one would hope that these would be taken care of in such a procedure. On the other hand, if external diseconomies are taken into account, the benefit stream will have to be depressed to the extent of these diseconomies or cost stream will have to be inflated by an amount equal to that required to mitigate these diseconomies. In case of risks and uncertainties associated with the success or failure of the plantations contemplated in the project or the assumption made about costs and benefits, appropriate factors will have to be used for weighting both the cost and benefit streams. This has not been done by Sathe & Susaeta (1973) or Mishra (1975) or Mathur (1975). A more rigorous analysis of external economies and diseconomies on account of this project and appropriate treatment of risks and uncertainties involved is called for in the project analysis.

If the Project Authority is viewed solely as an agency for the creation of plantations, then the project analysis is to be modified as under.

The Forest Department can clearfell and remove all the existing growth departmentally and hand over the area to the Project Authority for plantation. Alternatively, it can ask the Project Authority to work the area on its behalf and reimburse the Project Authority for all its expenses and also allow it a profit at a certain percentage of its expenses. In the latter case, the profit earned by the Project Authority in clearfelling the areas will be included in the project benefit.

In the benefit stream, the anticipated net revenues from establishment of plantations would be taken into account and in the costs, the expenses for formation of these plantations would be included. The rest of the analysis would be carried out as is shown in the project report by Sathe & Susaeta (1973). The only difference that it would make in project profitability is that revenues due to clearfelling of God given stand would be excluded and the internal rate of return, as pointed out by Sathe (1975) would be reduced from 19.2% to 14% for pure teak plantations.

SUMMARY

The present paper analyses the divergent view points of Mishra (1971), Sathe & Susaeta (1973) and Mathur (1975) regarding inclusion of revenues from "God given stand," as a project benefit. If the Project Authority is responsible both for exploitation and plantation of the area, it is logical to include revenues

from God given stand as Project benefit, for the Forest Department has been adequately compensated through payment of annual lease rental, Mathur's (19 5) plea for according a higher capitalised value by using risk free rate of interest, appears to be, at best, hypothetical, as this does not represent the current opportunity cost of the resources involved.

The original authors, as well as their critics, have not taken into account, the non market benefits (e.g. ample and convenient availability of industrial wood after maturity of plantations, increased job opportunities, infrastructural developments, forest based recreation etc.) or the costs (e.g. risks associated with monoculture like deterioration of soil texture, increased susceptibility to insect damage, etc) and it is to be solemnly hoped that these balance each other. In the absence of adequate data for quantifying such benefits and costs, an alternative approach is to use a lower discount rate than the going market rate of interest of $9\frac{1}{4}\%$ for benefit stream and a higher than market rate of interest for discounting for cost stream. The choice of the relative magnitudes of these two rates of interest is difficult to determine in the existing state of knowledge and arts and may have to be a matter of political decision till such time, as more data is collected in this regard.

महाराष्ट्र परियोजना के परियोजना-मूल्यांकन विश्लेषण में खड़े प्रकाष्ठ से होने वाली प्रत्याय—कुछ और विचार

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सारांश

प्रस्तुत अभिपत्र में ''भगवत् प्रदत्त मंनिधि'' से प्राप्त होने वाले राजस्व को परियोजना लाभ के रूप में सम्मिलित करने के सम्बन्ध में मिश्र (1971), साठे व सुसेता (1973) व माथुर (1975) के विभिन्न विचारों का विश्लेषण किया गया है । यदि परियोजना प्राधिकरण उस क्षेत्र के समुपयोजन और वन रोपण दोनों कार्यों के लिए उत्तरदायी हैं तो ''भगवत् प्रदत्त मंनिधि'' से मिले राजस्व को परियोजना लाभों में जोड़ना युक्तिसंगत ही कहा जाएगा क्योंकि वार्षिक पट्टा किराया भुगतान करके वन विभाग को पर्याप्त प्रतिपूर्ति मिल गई है । जोखिम मुक्त व्याज दर लगाकर अधिक पूंजीगत मूल्य लगाने का माथुर (1975) का तर्क बहुत कर कल्पित ही प्रतीत होता है क्योंकि यह सम्बन्धित मंसाधनों को सम्प्रति मिले अवसरों की लागत का परिचायक नहीं है ।

मूल लेखकों तथा उनके आलोचकों दोनों ने विचार करते समय अविक्रेय लाभों (उदा० वयस्कता प्राप्त होने पर औद्योगिक काष्ठ की प्रचुर मात्रा में और सुविधा से उपलब्धि, रोजगार के बढ़े हुए अवसर, अधिसंरचना विकास, वनों पर आधारित मनोविनोद आदि) अथवा लागन (उदा० एक जाति संवर्धन कराने का जोखिम जैसे मृदा वयन का व्याह्रास, कीड़ों से हानि पहुंचने की अधिक आशंकाएं आदि) को भी लिया है और पूरी-पूरी आशा है कि ये दोनों एक दूसरे का संतुलन कर जाएंगे । इस तरह के लाभों और लागतों को मात्रात्मक बनाने के आंकड़ों के अभाव में लाभ धारा के लिए प्रचलित बाजार व्याज दर $9\frac{1}{4}$ प्रतिशत से कम कटौती दर और लागत धारा का पासंग बैठाने के लिए बाजार में प्रचलित ब्याज की दर से अधिक कटौती की दर उपयोग करना विकल्प स्वरूप लिया जा सकता है । ब्याज की इन दरों की सापेक्षिक उच्चता की छांट को ज्ञान और कला की वर्तमान अवस्था में विनिश्चित करना कठिन है और जब तक ऐसा समय न आए और इस सम्बन्ध में अधिक आंकड़े एकत्रित न कर लिए जाएं तब तक इसके लिए राजनैतिक फैंसला ही करना होगा ।

Rückkehr von den Bestandbauhölzern in projektwertunger Analyse des
Maharashtraprojekts-Weitere Bemerkungen

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ZUSAMMENFASSUNG

Der gegenwärtige Artikel analysiert die abweichende Gesichtspünkte der Mishra (1971), Sathe und Susaeta (1973) und Mathur (1975) um Einschlaß des Einkommens aus den "Gottgegebene Bestand" als eine projekte Wohlstat. Wann die projekte Autorität beide zur Ausbeutung und Bepflanzung die Fläche verantwortlich ist, ist das logisch das Einkommen aus den "Gottgegebene Bestand" als eine projekte Wohlstat zu einschließen, weil die Forstabteilung durchdie Bezahlung der jährliche verpachtunge Miete angemessen ersetzen wird. Mathur's Gesuch, einen hohere kapitalisierte Wert beim risikofrei Rate des Zinses zu geben, erscheint, auf beste, hypothetisch weil das den gegenwärtige gelegenheite Preis der eingeschlossene Hilfsquellen nicht vertritt.

Die originelle Autoren, und auch ihre Kritiker, haben die nicht-markte Vorteilen (z.B. die weite und bequeme Gültigkeit des industrielle Holzes nachder Reife der Pflanzung, die vermehrte lohnarbeite Gelegenheiten, die nach-gebäude Entwicklungen, die forstbasierte Erholung usw.) oder die Kosten (z.B. die Risikon zur Einartkultur verwandt, nämlich die Schlimmerung der Bodentextur und vermehrte Empfanglichkeit zum Insehtschaden, usw.) betrachten, und das ist gehofft daß diese einander wägen werden. Als keine angemessene Angabe solcher Vorteilen und Kosten zu quantitätieren verfugbar ist, benutzen wir als eine Alternative eine mindere Rate des Diskontos als die gegenwärtige Marktrate des Zinses @ 9½% für den Vorteilstrom und eine hohere Rate des Diskontos als die gegenwärtige Marktrate des Zinses für den Kostenstrom zu diskontieren. Die Wahl der relative Größe dieser zwei Raten des Zinses ist in den gegenwärtige Lagen des Wissens und der Künste schwer zu bestimmen, und das mage eine Tat der politische Entscheidung, bishin mehre Angaben gesammelt sind.

Analyse d'évaluatien du projet entrepris au Maharashtra—Rendement d'un
peuplement ligneux. Eneore des commentaires

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Résumé

L'auteur a fait une analyse des points de vue divergents de Mishra (1971), Sathe et Susaeta (1973) et Mathur (1975), relalifs à l'inclusion des rentes forestières, provenant de "God given stand", dans les avantages retirés du projet. Si les autorités chargées du projet sont responsable d'exploiter at de reboiser la région, il est juste que le profit tiré du projet soit porté au crédit de celui-ci, car la Direction du Service Forestier a été récompensée en juste proportion en lui payant le bail annuel.

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