



## A Comprehensive Study of Economic Impact Analysis Methods with Respect to Tourism Industry

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**Abstract-** This paper discusses the critical analysis between the Input Output Analysis, Cost Benefit Analysis and Economic Impact Analysis by using the Computable General Equilibrium Model. The article discusses the importance of tourism, elements of economic development of the tourism. The article explores the core reasons of economic development of the destination. This study reveals different components, levels, views, approaches and perspectives involved in an analysis of economic development based models and techniques. The study attempts to conceptualize the elements involved for the economic development of the destination. The ultimate output of the analysis recognized that Economic Impact Analysis does not equate all the economic benefits incurred by the special event at the tourist destination. To calculate the impact of special events Cost Benefit Analysis is the suitable method because for a special event inputs are needed. The study emphasizes that Cost Benefit Analysis is fully focused on the calculation of economic efficiency. While Cost Benefit Analysis is unable to express the socio-cultural factors, political factors of human existence and the complications of ecological system. A conceptualized study of comparative analysis between Cost Benefit Analysis and Computable General Equilibrium Model which offer a foundation for structuring and assessing empirical research, and provide additional insights and knowledge into the dynamics and complexity involved specifically to analyze the suitable method to examine the economic development of the tourist destination. This paper acknowledges that event assessment, which focuses only on economic impacts, is too narrow in scope to provide sufficient information to policy makers and government funding agencies.

**Keywords:** Tourism, Cost Benefit Analysis, Computable General Equilibrium, Economic Development, Economic Impact.

### I. INTRODUCTION

Tourism is a sector which is largely associated with growth and development of the host country. Which has a positive impact on economic development and social development of the country, in the form of foreign exchange earnings, infrastructural development, development of other various important sectors which are associated with tourism. Tourists significantly spent money on accommodation, food and beverage, buying of various products, and recreational activities, which results the direct impact on the employment in the form of wages, taxes, and business growth. Tourism contributes significantly to the gross domestic product (GDP) and employment of an economy. As tourism industry is associated with the various industries such as, hotels and restaurants, transportation, recreational and clothing, purchase point and beverages.

To study the economic impact on direct, indirect and induced tourism, (Arabsheibani and Labarthe (2002) the input output model is used by using multiplier analysis of tourism expenditure on different sectors (Archer and Sadler (1976), Var and Quayson (1985)

Tourism provide the opportunities to create the earning sources for the local residents. It is an important component in the development of the region tourism. It has created many opportunities to increase the income, it stimulates the new business activities results into the employment generation, and income generation for the longer term. There are several objectives formulated with the economic development and sociocultural development of the destination (Abelson, 2011). Economic performance of the destination is calculated on the basis of the development in Gross Domestic Product (GDP) and Gross Regional Produce (GRP). (Dawer et al, 2005,2006)

In tourism trade pattern both the demand (Gray, 1970) and supply of tourism plays an important role two way intra industry trade has been taken place. (Bhagvati et al., 1971), (Dixit and Norman 1980). The

determinants of demand are classified into economic factors, noneconomic factors and institutional factors. (Divisekera, 2013) Also explained that the income level of the consumer is an important factor to calculate the yield of the tourism and which is the major determinant of demand of travel and tourism. The non-economic factors such as the popularity of the destination, leisure time and institutional factors such as the government policies to encourage the foreign tourists. The determinants of supply include, the costs, which are divided into two-folds, such as a traveler must visit the place of supply of tourism services which includes the costs of transportation. Second, a traveler must purchase tourism goods and services while visiting the destination. Noneconomic costs are including uniqueness of the destination, natural or manmade wonders, climate, culture, etc.

### **Objectives**

- The objectives are formulated to study the economic impact of tourism by using input output analysis.
- To study the Cost Benefit Analysis method with respect to tourism industry.
- To study and explore the parameters of Computable General Equilibrium Model

The GDP and GRP of the country with respect to the tourism industry is depend upon the total market value of all finished goods and services which are produced within the country or region for a given time period. Also it can be measured as the sum of the all values added at every stage of production also into the intermediate stages by all the industries including service industries as well within a country, plus taxes applied on it, subsidies given on the products and services to enhance the business opportunities and employment generation. Tourism assessment involves estimation of value added from the additional demand associated with it at special occasions such as the important religious event so that value added multiplier shows the important relationship between the factor costs associated with the tourism or the special events associated with pilgrimage tourism and change into the output by an extra unit.

### **Input Output (IO) Analysis –**

Input Output (IO) analysis, introduced by Leontief (1951) to measure the change in final demand for the goods and services Miller and Blair (1985), Fleissner (1993), Holub and Schnabl (1994), United Nations (1996), Kurz, Dietzenbacher and Lager (1998), Thijs ten Raa (2006), Eurostat (2008), the relationship between the interdependencies of all the sectors are calculated in the form of linear relationship of all input assimilates and output produced, Eurostat (2008), IO analysis continues to be a useful modelling technique that can be used to regulate, to define, to measure and to assess linkages between all interdependent industries or sectors. The IO analysis is related with the analysis of production structure, like product in one sector has been used for one process but for another sector it has been used for the another process, because of interdependent production system, so that IO analysis becomes more important for the exchange of product within intermediate industries Eurostat (2008), a very general and specified view of IO analysis depends upon the

- 1) Intermediates consumption (i.e. buying and selling) sales and purchase of goods and services amongst the organizations and firms.
- 2) final use of goods and services mainly by households, government agencies or units, investment firms and export industries
- 3) The important factors of production and primary inputs such as land, labor, and capital.
- 4) Prior value added things such as taxes, subsidies, net operating surplus and consumption, and import

To calculate these variables, to understand the economic importance of a particular sector or firm in the economy, simply the multipliers are generated through IO analysis which forms the wide use for policy planning and control, it will provide the systematic approach and statically reliable approach. To calculate and study the economic impact which caused the changes in the economy of a given industry the analytical approach is important and these multipliers are used for analytical purposes such as impact studies, the impact of changes in a given industry on the overall economy.

The I-O model follows a balanced accounting framework in which the total receipts by sellers must balance by the total expenditures by buyers. So that conventionally, total output is equal to total input for each producing sector in the economy. I-O offer comprehensive and detailed information regarding the sales and purchases of goods and services among various sectors of the economy and it represents an analytical tool for the economists, planners and policy-makers in tourism (Economic and Social Commission for Asia and the Pacific, 1990):

- It indicates the interrelations of the tourism sector with other sectors in the economy;

- It provides sustains for a statistically consistent and systematic approach and to understand the economic impact of tourism on the whole economy.
  - It validates the ascertainments of the relative size of the tourism sector in the overall economy and a comparison of the performance of the tourism industry in relation to the other sectors.
  - It reveals the interrelations of the tourism sectors with other sectors in the economy;
  - It provides a statistically consistent and systematic approach to understand the economic impact of tourism on the whole economy;
  - It enables the determination of the relative size of the tourism sector in the overall economy and a comparison of the performance of the tourism industry in relation to the other sectors.
- The I-O model also provides critical information for economic and demographic projections as well as for social accounting matrixes (SAM) and computable general equilibrium (CGE) modelling for public policy and alternative economic scenario simulations.

- To study the net income or consumption of existing households at the tourist destination, researcher explored the total income generation. Total income can be defined as the sum of all amount in terms of money generated from the various resources in the tourism. which results in to the increase in the standard of living of the people, increase in business income, employee income, household income. which are calculated before the deduction of all taxes. The income multiplier is associated with relationship between total income generated or earned by the household with respect to the final demand associated by the tourism. The additional income has been generated at the special events in pilgrimage tourism. So the basically income multiplier measures the proportionate gross value added in wages and salaries of employees or income earned in the household by excluding the gross operating surplus of suppliers.

- To study the employment generation at the destination. The employment multiplier describes the ratio of direct and secondary employment. Income multiplier can be defined as the direct employment generation by a unit of event with respect to the final demand associated with the event in pilgrimage tourism.

- To study the net welfare(prosperity) benefits to residents of the destination. It is the social welfare objective, increase in net welfare of the society. Typically, when benefit for the society is calculated as the if there is any improvement in the well-being of the society, and the cost is calculated as if there is any reduction well-being. Welfare of the society is broadly associated with the market and non-market goods such as environmental goods, travel time, leisure time, consumer surpluses and so on. The net benefit in a tourism is the sum of all benefits and minimize the costs associated with it. The total volume of the consumption of goods and services (Coplend, 1991) can be measured by calculating the total number of visitors and their duration of stay at the destination (Divisekera, 1995,2003) by considering the limitation that some of the tourists prefer to stay with their relatives or friends the another important facts or is the total expenditure of the tourists at the destination is to be considered. (O'Hagan and Harrison, 1984)

Measures of tourism prices are depending upon the tourism price that means the costs related to the consumption of goods and services at the destination and the travel price that means the costs are related to the transportation (O'Hagan and Harrison, 1984; Divisekera, 1995)

**Table No. 01 Input costs associated at the tourism destination**

<b>Costs associated with the Tourism Price</b>	<b>Costs associated with the Travel Price</b>
Accommodation	Distance to the Destination
Food and Drink	Uses of various modes of transportation
Local Transportation	Exchange rate of currency
Entertainment, Shopping	
Tourists Attraction and other related personal services	

**Cost Benefit Analysis: -**

Involves the calculation of relevant costs and benefits from the project. In social CBA includes the all social costs and social benefits to calculate the social net social benefits which will be helpful into the social decision making. (Boardman *et al.* 2001),

In a CBA, there are four important steps:

1. Identification of the cost and benefit items;
2. Quantification of the cost and benefit items;

3. Valuation of the cost and benefit items;

4. Calculation of net present value (NPV) and/or internal rate of return (IRR).

CBA versus Economic impacts analysis methods such as Input-Output method (I-O), Tourism Satellite Analysis (TSA), Computable General Equilibrium (CGE) method highly concentrated on the estimation employment generation, income generation and tourism export of the tourism or any event related to the tourism. While in the CBA method all the costs and benefits are taking into consideration with the consequence of positive or negative externalities.

There are some limitations to the economic impact analysis with respect to the Input-Output method (I-O) explained by Dwyer and Forsyth (2006).

1. Added resources are considered to be unemployed which is practically assumed and no resources constraints are presented.

2. Changes in the factors of production with the change in requirement results into the change in price and costs but in Input-Output method (I-O) price and costs are considered to be constant with the expansion or change in any economic activity.

3. There are constant ratios i.e. output changes with respect to change occurs in input demanded. between inputs and output, between value-added and output and with the assumption proposed of constant labor productivity.

4. Spending on new tourism products (e.g., an event) by the local population does not lead to a diversion of spending away from other goods and services.

NorbartVanhove (2013), in tourism sector the public sector plays an important role, so that many projects are associated with the general infrastructure of tourism. The classical method of investment appraisal is insufficient to calculate the economic impact analysis in tourism. It is an economic sector so that the cost benefit analysis is applicable. (Burgan and Mules, 2001) The CBA is the suitable method to calculate macro-economic analysis in which costs and benefits are calculated in different nature (Vanhove, 2011) and in many projects to calculate social cost benefit analysis is also important with the cash flow analysis because all relevant costs and benefits are calculated in this method (Prest and Turvy, 1967)

Into the CBA costs of the factors of production are to be calculated and considered it as opportunity cost to calculate the level of output. External costs on the third party (externality) (Vanhove, 2011) which are not directly involved into the consumption or production (Bull, 1995) but get affected which is also called as external affects (Sugden and Williams, 1988; Mishan, 1994) on the society due to the projects are also take into consideration into the CBA (Boardman et al, 2001)

Typical examples of negative (unpaid) costs in the tourism sector include water pollution, noise, traffic congestion, destruction of landscape, etc. Opportunity costs includes the costs of the resources required for the tourism which cannot be produce other goods or services. (Boardman et al, 2001). The negative effect (side effect) in tourism, new tourism projects competing to the already existing projects. With the presence of side of negative costs there is always presence of a positive side or benefits in the form of international exposure, arrival of tourists, increase in the value of the project(tourism) which results into the consumer surplus and producer surplus (Pearce, 1983; Boardman *et al.*, 2001) Producer surplus in tourism has a positive impact on the tourism related services such as restaurants, hotels, transportation services, Infrastructure development etc. which is also called as complementary development or indirect income.

net benefits" offered by CBA to inform policy making. There are two main approaches that can be used, each of which represents an important area for future research. The first approach to integration of EIA and CBA is to estimate producer and labor surpluses directly from the simulated outcomes of a CGE modeling of an event's economic impacts. In essence: Impact of event on real GSP less costs of the factors of production (land, labor and capital) = business surplus + labor surplus = net economic benefit of event

Economic Impact Analysis does not equate all the economic benefits incurred by the special event at the tourist destination. To calculate the impact of special events Cost Benefit Analysis is the suitable method because for a special event inputs are needed, additional labor must be hired, additional capital must be made available, more land will be estranged and more natural resources will be used up, with attendant social and environmental effects (Larry Dawyer,2015). In CBA comparison of all present and future benefits with the

costs which are expected at present and in future for the special events has been taken place. CBA is very easy technique for analysis and understanding it includes all the costs and benefits associated with an event.

Opportunity costs are defined as, what are the best alternative chosen by the people or society for the investment of capital, employment for workers over the related activities of an event, by measuring the net benefits of projects. These opportunity costs are measured as an economic cost by formulating the policies in a standard manner. CBA improves the information base for public sector decision making, thereby assisting in the assessment of relative priorities (Dwyer, 2012).

**Table No. 02 Estimating the Costs and Benefits for an event**

<b>Costs</b>	<b>Benefits</b>
Capital Expenditures on infrastructure	Revenue earned by the business surplus at tourists place
Operating expenditure	Consumer surpluses for local households
Costs incurred by Government agencies	Direct or indirect participatory benefits
Social and environmental costs	Producer surplus, labor surplus, at the tourists place

**Computable General Equilibrium –**

In the analysis of large public investments or policies that are expected to impact multiple sectors and actors in an economy with dynamic effects, a dynamic CGE approach is powerful. CGE analysis captures important intersectoral, and backward and forward linkages, and the direct, indirect, and induced benefits of an investment (Cattaneo, 2002; Dixon & Rimmer, 2002; Dwyer et al., 2003; Dwyer et al., 2005; Banerjee et al., 2015). Pearce et al. (2006) suggest that where projects are large and complex, partial equilibrium frameworks are seldom sufficient and that the analytical framework should be capable of considering a wide range of impacts on all sectors that may be impacted. All project spillovers and indirect costs and benefits should be accounted for. A core strength of the CGE approach is its meticulous detail in appraising spillovers of an intervention (Pearce et al., 2006).

Ex ante economic impact analysis with CGE models has been applied to public investments in the forestry (Banerjee & Alavalapati, 2014; Banerjee et al., 2016a, 2019) and tourism sectors (Taylor, 2010; Taylor & Filipinski, 2014; UNWTO, 2014; Banerjee et al., 2015, 2016b, 2018). Indeed, CGE analysis can be applied across a broad range of economic sectors where large public investments are concerned and inter sectoral linkages are important. Beyond consideration of economic impacts of public investments, CGE models have a long history in applied policy analysis, from fiscal to trade to environmental policy analysis, with CGE models distinguishing themselves as the “workhorse” of policy analysis (Jones, 1965; Dixon et al., 1992; Dixon & Jorgenson, 2012). As Nobel Economist Kenneth J. Arrow stated: “in all cases where the repercussions of proposed policies are widespread, there is no real alternative to CGE” (Arrow, 2005, p. 13). CGE models are mathematical models that consist of systems of equations, which describe the relationships between sectors, agents, and other accounts in the underlying Social Accounting Matrix (SAM). CGE models are based on SAMs for a country, region, or for all countries linked together through trade as in the Global Trade Analysis Project database (Aguiar et al., 2016). A SAM provides a snapshot of an economy describing all monetary transactions between economic sectors and its agents, including households, government and enterprises, and the relationships between the modeled economy and other countries or regions of the world (King, 1985; Pyatt & Round, 1985).

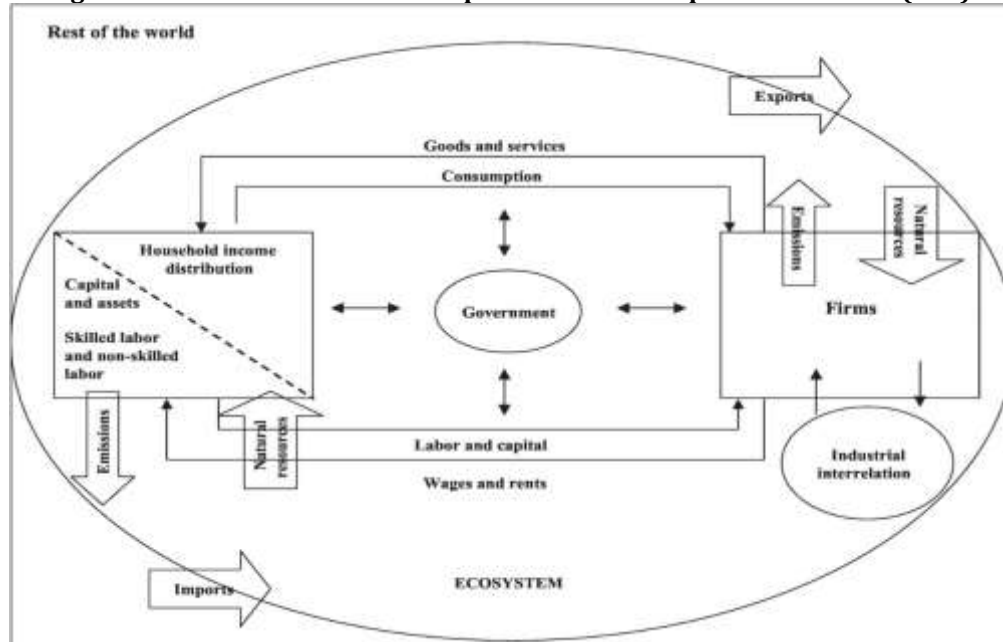
A SAM is constructed based on a country’s System of National Accounts (European Commission et al., 2009) including integrated economic accounts, fiscal accounts and balance of payments data, and often government survey data such as household income and expenditure surveys. Recently, with the publication of the first international standard for environmental statistics, the System of Environmental- Economic Accounting Central Framework (European Commission et al., 2012), it has become possible to integrate detailed environmental information into CGE models. The development of the Integrated Economic-Environmental Modelling (IEEM) Platform has important applications for tourism investment analysis where tourism demand is a function of natural capital stocks and environmental quality (Banerjee et al., 2016c, 2019b).

**Circular flow of CGE –**

- A set of economic agents such as firms, households and government whose behavior is to be analyzed.

- Behavioral rules for these agents that reflect their assumed motivation such as profit maximization for firms and utility maximization for consumers.
- A set of signals observed by these agents on which they make their economic decisions, such as market prices or government rationing quotas.
- Institutional structure of the model economy, which are the rules of the game by which various agents interact. For example, perfect competition implies that each agent is a price taker and prices are flexible.
- A set of explicit definitions of equilibrium conditions which are "system constraints" that must be satisfied for the whole economy but which are not taken into account by each individual agent in making his decisions.

**Figure No. 01 Circular Flow of Computable General Equilibrium Model (CGE)**



**The advantage of this approach is that the CGE modeling**

informs the destination manager about the direct and indirect economic impact effect of the event as well as inter-industry and taxation effects, while at the same time providing a basis for the estimation of the business and labor surpluses essential to a CBA. The approach requires the making of certain assumptions, but is a way of integrating (to some extent) CGE and CBA.

A second approach involves the development of measures of economic welfare by adding additional assumptions to the standard CGE model. CGE models can include a welfare measure (Blake, 2005). Some CGE models are explicitly designed to measure changes in welfare (Dixon, 2009). In his study of the economic impacts of the London Olympics 2012, Blake (2005) includes a measure of resident welfare. Consistent with economic theory, Blake's model measures a change in welfare using Equivalent Variation (EV), which indicates how much the change in welfare is worth to the economy at the pre-simulation set of prices. Blake takes the EV (the nominal income the consumer needs at one set of prices in order to be as well off at an alternative set of prices) as a monetary measure of the welfare effects of different policy scenarios. This measure takes the results from what may be quite complex effects of a simulation on a household and produces a single value to describe how much better (or worse) off the economy is as a result of such effects. It transforms the economic impacts into a measure of welfare based on various assumptions about labor supply and external inputs. This is an emerging area for CGE modeling, and an emerging area of research interest for the evaluation of special events. Notwithstanding the limitations of the combined or integrated approach to date, the use of CGE modeling incorporating welfare measures of household, business and labor surpluses that comprise important components of a CBA represents an important step in clarifying and

reconciling the differences that often exist between EIA and CBA of a special event. It represents an important area for future research

### **Comparison between CBA and CGE**

1. CBA is the technique to calculate all the costs and benefits of a tourism event while CGE is the model development for the calculation of the impact of tourism on the economy it's an economic impact analysis technique. Both techniques are developed and focused on a different aspect of calculations and evaluation of a problem.

2. CBA is a very detailed process and concentrated on having direct impacts on the project and it's a partial equilibrium technique. CBA is focused on external costs(externalities) as well as unpaid underpaid costs and benefits of the project and its adjacent effects on non-price issues such as noise pollution, impact on the environment, traffic congestion.

CGE is a general equilibrium technique, it focuses on the direct impact of a project and it is less detailed (Dwyer and Forsyth 2006).

3. CBA is considered for a long time duration indeed benefits occur after a long time. Risk and uncertainty are more in CBA model calculation. CGE models are developed for assessing the economic impact on the economy, GDP, employment generation.

4. CBA is fully focused on the calculation of economic efficiency. While CBA is unable to express the socio-cultural factors, political factors of human existence and the complications of ecological systems (Stabler *et al.*, 2010)

Trevor Mules and Larry Dwyer (2005), Yang (2009), studied the Computable General Equilibrium (CGE) model with respect to the travel and tourism industry of Taiwan with the use of the Consistent Social Accounting Matrix (SAM) due to the impact of the SARS epidemic. It has been found that inbound tourism in Taiwan is highly affected and results in the reduction in inbound tourism, employment in tourism-related industries. The researcher also studied the impact of the epidemic on the economy of Taiwan. GDP of the country also decreases between 0.429% to 0.774%. It also has an adverse impact on export-import, investment, consumption, private industries and consummation and government industries' economies.

5. CGE models treat an economy as a whole, allowing for feedback effects of one sector on another. The models rely on explicit assumptions about government policy settings, and can incorporate a more realistic set of economy-wide constraints on the supply side of the economy. The projections of the models are to be thought of as deviations from base-case projections (Dixon and Parmenter 1996). In measuring economic impacts, there is a need to model the economy, as far as it is possible recognizing other sectors and markets, and capturing feedback effects. CGE models do this, and thus they represent a much more rigorous approach to estimating impacts and a much more informed basis for policy making (Bandara 1991). CGE models are now increasingly used in tourism economic analysis and policy formulation.

## **II. DISCUSSION AND CONCLUSIONS**

In this article, we draw on the strengths of Input Output Analysis, CBA and CGE modeling and present a rigorous and integrated approach to evaluating the economic impacts of tourism. An EIA of events emphasizes the injected expenditure associated with events as the basis for further analysis, a CBA recognizes that the consumer surpluses of residents are essential to event evaluation. In contrast to EIA, which treats resident expenditure on an event simply as "transferred" expenditure which is then ignored, CBA emphasizes that the residents of a destination may benefit from an event, alongside owners of capital and workers who might gain jobs. Therefore, it is insufficient just to focus on net injected expenditure and its economic impacts. In bringing residents' values back into the assessment, CBA thus improves the information base for public sector decision making, thereby assisting in the assessment of relative funding priorities.

This paper acknowledges that event assessment, which focuses only on economic impacts is too narrow in scope to provide sufficient information to policy makers and government funding agencies. Where practical, a more comprehensive approach should be employed to embrace the importance of social and environmental impacts in addition to economic impacts. In particular, estimation tools required to measure welfare effects associated with special events need more detailed attention from researchers. The challenges arising

from the task of estimating the net benefits of special events as part of amore analytical and evidence-based justification for the level of government fundingsupport should dominate the economic research agenda regarding special events inthe future.

The standard approach to event evaluation has been for researchers and consultants toestimate the economic impacts of an event and then, alongside these, consider some ofthe possible wider effects of events that are not captured in the economic modeling, butwhich can be estimated using a formal CBA. This has resulted in a less than satisfactoryapproach to event evaluation since the EIA and the CBA can give conflicting results. Economicassessment models should reflect contemporary developments in economicanalysis. An important topic for future research should be the issue of reconciling EIA and CBA. Approaches to event assessment deserving further study include using a CBA as backup to an EIA study, or using EIA as a back up to a CBA study. Both present challenges butwith promise to greatly improve the art of event assessment.

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