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DECLARATION

I, Sri Uttam Deb, bearing Registration No. Ph.D./1078/10, dated 30/03/2010, hereby declare that the subject matter of the thesis entitled "Technical Efficiency and Growth of Total Factor Productivity: A Study on Tea Industry in Assam" is the record of an original research work done by me under the guidance of Dr. Ritwik Mazumder, Assistant Professor, Department of Economics, Assam University, Silchar. I further declare that the contents of this thesis did not form the basis of any award or degree to me or to anybody else to the best of my knowledge. The thesis has not been submitted to any other University/Institute for any award or degree or for publication.

Place: Silchar Sri Uttam Deb

Date:

ACKNOWLEDGEMENTs

At the very outset, I express my sincere and heartfelt gratitude to my doctoral research supervisor Dr. Ritwik Mazumder of the Department of Economics, Assam University, Silchar, for his guidance, supervision and suggestions during the course of present work. It was all due to his kind co-operation, relentless encouragement and enthusiasm that the present work could be taken up and completed successfully. I shall ever remain indebted to him.

I am grateful to Prof. A.K. Sen, HOD, Department of Economics; Prof. S. Dutta, Department of Economics; Prof. N. Roy, Registrar, Assam University; Prof. D.K. Pandiya, Dean, Mahatma Gandhi School of Economics and Commerce, Dr. Subhrabaran Das and all other teachers of the Department of Economics, Assam University, Silchar, for their valuable advice and suggestions till the accomplishment of the present research.

I wish to thank Dr. Siddeswar Bora, Principal, Sarupathar college, Dr. Hemo Handique, the HOD Economics, Sarupathar college, Mr. Ruhini Gogoi, the then HOD economics, Sarupathar college, Mr. Atul Saikia, Assistant Professor, Sarupathar college, Mr. Samarendra Singha, Mrs. Pranati Singha, Mrs. Aparna Bhattacharjee, Mr. Prosunkanti Deb, Mr. Benudhar Dutta, Mr. Mintu Bora, Mr. Sontu Deb, Lt. Swadeshbaran Biswas and his family who supported me during the tenure of my survey work.

No words are sufficient to express my thanks and heartfelt gratitude to all my friends specially Ashish, Golab, Dipankar, Abhinash, Bhaskar, Kabyasree, Dhananjoy, Sankuda,

Debeshda, Manikda, Sukantoda, Satyajitda, Dhrubada, Sudiptada, Sudarshanda, Snigdha and Santanu who encourage me during the tenure of the work.

Above all, I shall remain ever grateful to my father Shri Pramesh Deb, my mother Mrs. Sabitree Deb, my elder brothers Mr. Pankaj Deb, Mr. Pranay Deb and their family and Mr. Prabir Deb, sisters Mrs. Sikharani Paul, Mrs. Deepa Deb along with their family members, for their moral support, encouragement and sacrifices. Without their moral and relentless emotional involvement it would not have been possible for me to accomplish the colossal task of completing my doctoral research programme within the stipulated time frame.

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Preface

In modern microeconomic jargon productivity and efficiency are perhaps the two most essential aspects that are required to evaluate the relative performance of producers, firms or production units in general. Identification of the precise causes behind loss of productivity and efficiency is important from the point of view of policy recommendations that are targeted to enhance the performance of production units. Any study on relative performance of production units has to be justified. Efficiency promotion is necessary from the stand point of survival of a firm (production units) under a competitive set up but its importance diminishes as the market becomes less competitive. It may be argued that competition improves the performance of firms by forcing it to enhance its profit generating activities. Besides competition, the reduction or abolition of constraints imposed by rigidities in the market structure can enable the production units to improve their performance in absolute terms but not necessarily in relative terms. Measurement of efficiency and productivity based on empirical observation is vital from the view point of inter-firm comparison of performance.

In judging the performance of production units we commonly examine whether the unit is productive and (or) efficient. However according to the standard theory of production the terms productive and efficient are not synonymous. The term productivity (marginal or average) denotes the ratio of output produced to input used. In case of a single output with multiple inputs productivity is implied in the partial sense and the ratio of output produced (measured in suitable units) to the quantity of a single input used (measured in suitable units) is taken as a measure of average productivity of that input. In case of a

single input and single output average productivity is simply the ratio of output to input used for the specific output given all other inputs. Productivity maybe also measured in the multiple input multiple output case where one can find a weighted aggregate of outputs and inputs by employing an economically suitable logic and then the ratio of the two scalars may be computed (Neogi, 2004).

Now days, efficiency is a fundamental issue in the sphere of economics of production. Irrespective of the economic system under which the firm performs, a study on productivity and efficiency is not only relevant but is the key to developing growth oriented micro and macroeconomic policies. In a densely populated developing country like India, resources are scarce in a relative sense if not in an absolute sense. Consequently the most challenging task facing the socio-economic planner or the government is that of provision of effective and sustainable livelihoods for an enormous size of working age group population. However this is impossible to achieve without the generation of vast quantity of resources. Since most resource endowments are given and fixed both in an absolute and relative sense it is extremely obligatory to use these limited resources as efficiently as possible. Arguably this would generate sufficiently large amounts of surpluses for re-investment. Ultimately promotion of efficiency and productivity can gear up the pace of development (Adhikary, 2004).

Efficiency studies are vital from the environmental angle also. Exhaustible or non-renewable resources once depleted can never be restored to previous levels. Firms need to stop over-utilization and mismanagement these resources. Conscious efforts through R&D have to be put in order to develop techniques of production that are non-renewable resource saving. For a given technology, however, efficient use of non-renewable resources (as petroleum, coal, minerals etc.) is essential from the view point of

sustainable development. On the other hand, polluting industries can promote environmental sustainability in the sense that same output (by quality and quantity) may be produced by emitting lesser amount of pollutants or by saving inputs that are more polluting or cause higher levels of emission of harmful chemicals and green house gases.

The present study makes a pioneering attempt to measure and analyse total factor productivity growth and technical efficiency in the tea industry of Assam over the ten year period 2001-10 on the basis of both primary as well as secondary data. The study is econometrically involved which is attributable to the nature of its objectives. A sample of thirty one tea estates of Assam is selected from two different agro-climatic zones – namely upper Assam and Southern Assam (or what is otherwise known as Barak Valley) for the purpose of econometric measurement and analysis of productivity and efficiency. Alternative measures of total factor productivity growth (using both parametric and non-parametric approaches) are based on both estate level primary data as well as industrial level secondary data at the state level. Analyses based on the estate level data focus on the cultivation part or plantation sector, while analyses based on overall industry level secondary data (for factory sector) focus on the tea processing or the manufacturing sector. The measurement and analyses of technical efficiency are entirely based on estate level data which is basically plantation sector data. The selection of the tea industry of Assam is not difficult to justify.

On the one hand almost fifty percent of India's annual tea output originates from the state of Assam. On the other hand tea industry is the largest industry as well as the single most important industry of Assam. The industry is strategically important as because it has a plantation sector based on cultivation and a processing sector that is based on factory units or manufacturing units. Finally no systematic and comprehensive studies on

efficiency and total factor productivity growth on the tea plantations and tea processing are reported in literature. This justifies the need for the present research undertaking.

The tea industry occupies a place of considerable importance in the Indian economy. Producing around one-fourth of the world's annual tea output, the tea industry in India employs around 1.26 million people directly and around 2 million people indirectly. Over the past hundred years a few Indian tea gardens have produced the world's finest and hence some of the world's costliest varieties of tea. India is the single largest consumer of tea globally and has one of the highest per capita consumption levels as well besides a few other Asian nations. Since domestic tea demand accounts for over 85 percent of the country's tea output, India's exportable surplus of tea is rather limited. This has pegged India's global share in tea trade at a low level.

Although tea is produced in 14 States of India, five of them—Assam and West Bengal in eastern India, and Tamil Nadu, Kerala and Karnataka in the south account for over 98 percent of India's tea production. However the two eastern states alone account for over 75 per cent of India's total annual tea output. Out of this 85 to 90 per cent is consumed domestically. The surplus after domestic consumption, much of which is of high quality, is exported mainly to Europe and other western nations.

Although the tea industry plays a pivotal role in the industrial performance and growth of Assam it has faced several challenges in recent years. The growth rate of tea production as well that of factor productivity at the state level has been far from satisfactory. The present research has analysed the recent trends in productivity and efficiency with the objectives of facilitating the efficiency and growth along with removal of production constraints in the tea industry in Assam. Expectedly this research document would assist policy makers to strengthen the production base of the industry. The key issue here is that even under existing technology, there might be potentials for improving both productivity

and efficiency of resources use. Hence extension strategies may be required to train estate owners regarding the rational use of inputs. Cost cutting, through mechanisation, may also be suggested.

It is believed that this doctoral dissertation would be extremely useful for two types of researchers. First this would be useful for researchers dealing with techniques of measurement of total factor productivity growth and efficiency in both plantations and industries using parametric and non-parametric methods. To the advantage of the reader most of the popular methods of measurement of total factor productivity growth and technical efficiency have been outlined in detail in the thesis. Second this would be a useful document for researchers interested in the performance and growth of the tea industry in India. Since both plantations as well as factory processing of tea are studied, the thesis would aid the future researchers in field of productivity and efficiency to apply these techniques and methods to either the tea industry for other regions and states, as well as other plantations and processing based industries.

No research can practically be complete besides being free from errors. Any errors and omissions, whether methodological, technical or typographical are entirely the responsibility of the researcher. Admittedly this thesis still has few scopes of improvement and it is sincerely hoped that future researchers in this area would not only extend this work but would also enrich it by eliminating its voids and shortcomings.

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