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PRIME PUBLICATION - 03 03C

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**A REDEFINED PRODUCTIVITY MODEL &
SOCIO-ECONOMIC DEVELOPMENT ORIENTED
MANAGEMENT DECISIONS (ALGEBRAIC MODEL)**

FULL TEXT OF THE RESEARCH PAPER PUBLISHED BY

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**PUBLISHED IN *ALTIJARAH*
Journal of the Sharjah Chamber of Commerce & Industry,
United Arab Emirates**

ISSUE	Pages	Details	Publication
May 2001	26 to 28	Part - 1	Part 2 here is
September 2001	20 to 23	Part - 2	Part
March 2002	32 to 35	Part - 3	2 + 3 of ALTIJARAH

Animated Computer- Slide Supported Presentation is available with DR.VSRS

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ICFAI Journal of Managerial Economics, ICFAI University,
Hyderabad, India. August 2004. Pages 25 to 41.**



**An Innovative Productivity and Management Decision Model for
2000s**

KEY WORDS

Algebraic Model, Decision Methodology, Economic Development,
Management Decision, Productivity, Redefined Productivity,
Social Development, Socio-Economic Development

JEL CLASSIFICATIONS

A13, B41, C52, C67, D78, D84, M21, M33, P27



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EXECUTIVE SUMMARY

In the 1977 Nobel Symposium held in Stockholm, **Harry.G.Johnson** (1923 - 1979. Canada) defined technology as an intangible investment in any productive operation. This techno-investment concept opened the channel to evaluate the effectiveness of any techno-commercial operation in terms of its return to the Social and National Cultural environment. Using this as a thought-provoking guide-line, I happened to discuss the modus operandi followed by persons, who are committed to accelerate the pace of Socio-Economic development, among nations in different brackets of development. This covered a range of active and accredited persons in Administrative, Business, Nobel Laureates in Economic Science, Political, Professional and. Social circles. Based on the outcome of these discussions and the concept of techno-investment, I redefined Productivity as a Ratio between pre-determined Socio-Economic Development goals and the Inputs, subject to a favourable ratio of Physical outputs to Inputs . Between 1997 and 1998, I applied this expanded Productivity model in my Socio-Economic development and Management oriented assignments in different parts of the world, in different brackets of development, in different areas of management span, and evaluated its utility during my know-how update visits to these countries,. Based on these experiences, this paper is prepared to design a suitable Management-Decision model with reference to this enlarged Productivity definition, so as to aid an accelerated pace of Socio-Economic Development as a Prime goal.

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Assuming n inputs, m outputs, x goals, y ratios of outputs to inputs and z ratios of goals to inputs, the expanded Productivity model is developed in this Part-1. But the integration of this model with Management Decisions relating to input and output, and generation of conditions with reference to Socio-Economic Development goals, need a vicious dimension in its implementation. The conditions generated in Part - 1 provide a lead to integrate the Management Decision process in the world, with the expanded Productivity model and operating constraints, in Part-2.

f = Function of **Σ** = Sigma (Summation)

01. TECHNO-INVESTMENT CONCEPT.

Harry.G.Johnson (1923 - 1979. Canada) in his paper "Technology, technical progress and international allocation of economic activity", presented in the 1977 Nobel Symposium held in Stockholm, Sweden, summarised his views as "Technology is a form of capital, and its availability alterable by investment. Consequently, satisfactory analysis of it must be treated broadly in terms of social and national cultural encouragement or discouragement of this form of investment, and the investments in general".

This infers the narrowing of the gap between capital investment, a tangible motivator to the productive activity in a nation; and the techno-commercial know-how, an intangible innovator to convert the inputs to outputs, at socially acceptable quality and economically justifiable cost. If the technology assumes a form of an intangible investment, then its effectiveness and productive analysis should be oriented towards the social, cultural and intangible contributions to a broad-based society in each nation. Hence, technology in the current millennium could be designated as a Techno-Investment .

Effective evaluation of the throughput technology is measured through the concept of Productivity, a ratio of physical outputs to inputs. If the technology assumes the role of an intangible investment, then the Productivity should measure a broad-based social and cultural encouragement of the techno-investment, through its contribution to the Socio-Economic development of the nation.

02. CONGLOMERATION OF EXPERIENCES.

With these thoughts as a basis for my discussion, I exposed this new dimensional approach to a team of diversified, but critically responsible persons in different nations, committed and working towards an accelerated Socio-Economic development.

During my international assignments and on-the-assignments know-how update visits to different countries in the world, during the period 1978 to 1998, I had the opportunity to meet, discuss, read and collect the experiences about their approach to optimise the Socio-Economic upgrade in their respective nations and regions, from the following :-

- A. Prime Minister of a large self-sufficient and self-reliant developing nation in Asia.
- B. Secretary General of the Commonwealth nations.
- C. President of a Regional Development Bank in West Indies.
- D. A Nobel Laureate in Economic Science from West Indies / USA.
- E. Cabinet Secretary of a stable and developing nation in the Africa.
- F. Members of the Project implementation and Post-appraisal team From the World Bank
- G. A successful Lebanese business man.
- H. A leading Arabic business-man operating in Middle-East with German collaboration.
- I. A Japanese consultant from an organisation which has collaborated projects in America and Europe.
- J. General Manager of a Multi-national American corporation.
- K. An internationally accredited American University Professor, conducting seminars and work shops on computer technology in different parts of the world.
- L. Technical director of an American organisation, which has under-taken the project of Forestation of deserts in Middle-East, through Horticultural innovation.
- M. A progressive Congressman of the United States of America, who has substantially contributed for up-gradation of the developing world..
- N. A leading Farmer and accredited village Social worker from Tamil Nadu, India, who pioneered to create a School and drastically altered the Socio-Economic infrastructure of a backward village.

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The conglomeration of their experiences indicate that the term Productivity has enlarged its scope in the current millennium, to synchronise with many techno-commercial innovations in different parts of the world

If their views supported by the Techno-investment approach is used as a basis to define Productivity, then it can no more remain as a simple arithmetic ratio between two physical units, namely the outputs and inputs. If the output has to provide the products and services at socially accepted quality, and economically justifiable costs, then the term Productivity needs an updated definition.

03. PRODUCTIVITY REDEFINITION.

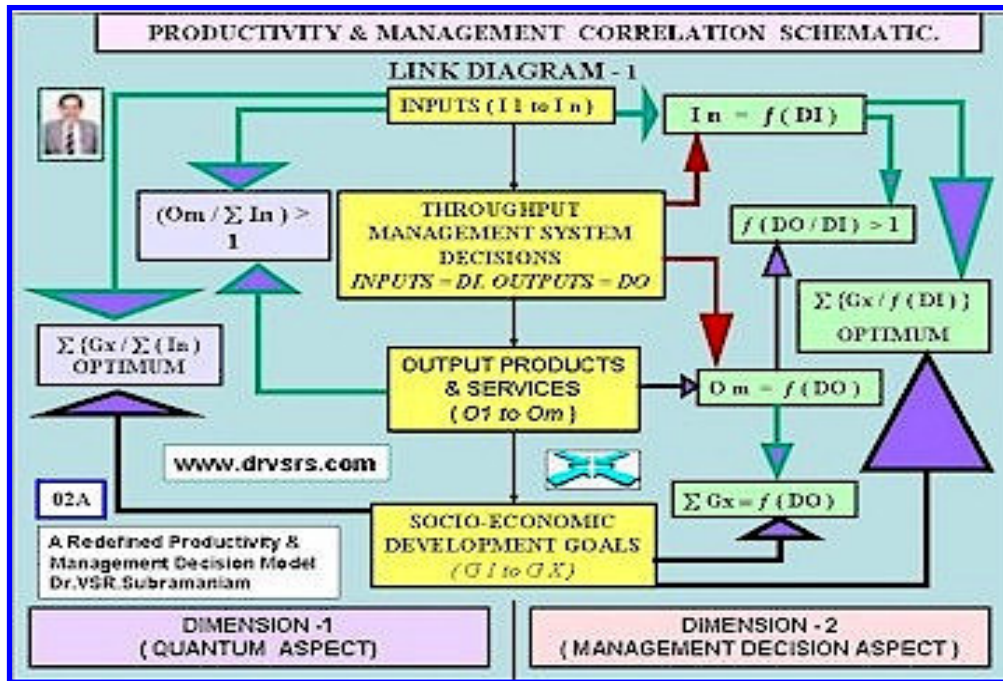
As supported by the above developments and experiences, I have expanded the definition of Productivity as below :-

"Productivity is represented by the ratio between the Socio-Economic development goals and the inputs, subject to a favourable ratio of Physical outputs to inputs".

The Socio-Economic development goals should be determined by each nation in line with their national objects, reviewed and updated at periodic intervals. Even-though the redefinition of Productivity has imparted a vicious dimension to its frame of reference, a closer review of the approaches of different nations in the world, indicates a positive and practical value for this redefinition.

All the current world environments support the concept that Socio-Economic development goals of each nation takes priority, and all the outputs, inputs and technology are strategically applied towards the attainment of these goals. However, the velocity, quality and quantum of the Socio-Economic achievement is controlled by the elasticity of outputs to inputs. It is also observed that any activity, even-though highly productive in terms of the output to input ratio, if they do not contribute towards the expected Socio-Economic objects of the nation, then they are discouraged by promulgating suitable ordinances on priority basis. Nationalisation of profitable and well managed multi-national operations in developing nations, is an example of discouragement of productive operations, which drain the internal resources to benefit an external developed nation, against the domestic Socio-Economic development goals. Hence, the objective of this paper is to critically review the enlarged Productivity definition, and design a suitable Management-Decision methodology, using an algebraic approach.

04. PRODUCTIVITY MODEL (ALGEBRAIC MODEL)



LINK DIAGRAM - 1

Productivity is the critical indicator of the performance of any operation, and traditionally it is arrived as a ratio of the physical outputs O and the corresponding physical inputs I . If the scope of Productivity is enlarged to consider Socio-Economic Development goals G as superior to the output O, then the inputs I should be evaluated with reference to G primarily, and with reference to O with secondary preference .

Any evaluation process becomes optimum, if the different components are properly quantified, simulated into a mathematical model, solved and the results are interpreted into implementable guidelines. The modeling technique also aids the integration of the practical constraints in the solution process. In order to make this approach, the following are assumed to exist in the productive cycle of a nation :

- Inputs **I** (I1 to In).
- Outputs **O** (O1 to Om)
- Goals **G** (G1 to Gx)
- Ratios **R** (Ratios of Output to Input **R1** to **Ry**)
- Productivity **PG** (Ratios of Goals to Input & Goals to Output - **P1** to **Pz**)

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To synchronise the approach towards the Socio-Economic development orientation, in the assumptions, Productivity PG is taken as the ratio of the goals G to the applicable input I , and the ratios R of outputs to inputs are considered as a peripheral guideline. The assumptions cover n inputs, m outputs, x goals, y ratios of outputs to inputs, and z ratios of goals to inputs. Then the possible Productivity ratios are :-

$$PG1 = G1 / (I1 + I2 + \dots + In) \ \& \ G1 / (O1 + O2 + \dots + Om)$$

$$PG2 = G2 / (I1 + I2 + \dots + In) \ \& \ G2 / (O1 + O2 + \dots + Om) \ \text{etc....}$$

$$PGZ = GX / (I1 + I2 + \dots + In) = GX / \sum In \ \& \ \dots \ (01)$$

$$GX / (O1 + O2 + \dots + Om) = GX / \sum Om$$

From (01) Total Productivity PG is given by

$$PG = PGZ = \frac{\sum \{GX / \sum In \}}{\sum \{GX / \sum Om \}} \ \dots \dots \dots \ (02)$$

Possible Outputs to Input ratios are :-

$$R1 = O1 / (I1 + I2 + \dots + In) , \ R2 = O2 / (I1 + I2 + \dots + In) \ \text{etc.....}$$

$$Ry = Om / (I1 + I2 + \dots + In) = \{ Om / \sum In \}$$

The conditions on outputs to inputs are so that each ratio R1 to Ry should be greater than, 1, or

$$Ry = \{ Om / \sum In \} \ > \ 1 \ \dots \dots \dots \ (03)$$

The objective of each nation should be to optimise the Productivity PG given by (02), subject to the condition (03). This is diagrammatically shown in *Link Diagram -1*, under Dimension-1.

05. IMPACT ON MANAGEMENT DECISIONS.

Acquisition of input resources and pattern of output products / services generation are the functions of the throughput Management Decisions. Under the normal definition of Productivity, the Decision methodology is highly flexible, permitting any combination of output selection, and a scope to get any input resources, only ensuring that their ratios are always favourable.

But the enlarged redefinition of Productivity with Socio-Economic development goal as the prime third dimension, controls the Decision through the following :-

- a. Select outputs, which will aid the Socio-Economic goals optimisation.
- b. Obtain inputs without violation to the Socio-Economic goals.
- c. Ensure that the cumulative goals are optimised through inputs, subject to a favourable ratio of outputs to inputs.

Using the above quantum representations, it is possible to derive the following conditions for Management Decisions.

- a) Providing a given combination of output products or services O_m , is a function of Output Decisions DO or

$$O_m = f (DO) \text{ ----- (04)}$$

- b) Acquisition of needed inputs I_n to meet the decided outputs O_m , is a function of Input Decisions DI or

$$\sum I_n = f (DI) \text{ ----- (05)}$$

- c) Productivity, measured with reference to Socio-Economic development goals G_x through the utilisation of the inputs I_n , corresponding to the relationship (02) is given by

$$\sum \{G_x / \sum I_n \} = \sum \{G_x / f (DI) \} \text{ --- (06)}$$

Outputs to input ratios corresponding to (03) is given by

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$$R_y = \sum \{ O_m / \sum I_n \} > 1 = f \{ DO / DI \} > 1 \text{ ---- (07)}$$

In addition to the above, the outputs O_m should be synchronised with the Socio-Economic development goals G_x , or

$$G_x = f (DO) \text{ ----- (08)}$$

The Management Decision guideline should be to optimise the relationship (06) subject to conditions (07) and (08). These establish a vicious span to the area of Management Decisions under the redefined Socio-Economic Productivity objective. This is shown diagrammatically in Link Diagram - 1 under Dimension-2.

06. MANAGEMENT DECISION GUIDELINES.

The mathematical relationships derived above, supported by *Link Diagram - 1* provides a basis to view the scope and dimensions of Management Decisions, relative to the Socio-Economic development oriented Productivity guidelines.

Now it is possible to integrate this Decision equations with the constraints in any operating environment, and develop an implementable Management-Decision model.

This paper has provided a lead towards the development of such a model, solve and interpret the operating guidelines, in Part-2.

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PART-2 : MANAGEMENT DECISION MODEL

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EXECUTIVE SUMMARY

Like a capital investment to initiate a productive activity, technology is an intangible investment to convert the inputs to the outputs. Hence, both these should be evaluated with reference to their return towards the social and national cultural environments. This concept initiated by Harry.G.Johnson (1923 - 1979. **Canada**) during the 1977 Nobel symposium, is endorsed by the persons in the international scene, who are committed to the Socio-Economic development of their nation or region, This warrants a redefinition of Productivity to suit the expanded scope. Accordingly, the Productivity is redefined as the ratio of Socio-Economic development goals to Inputs, subject to a favourable ratio of Outputs to Inputs. In order to apply this enlarged Productivity concept under practical operating environments, a mathematical model is framed in Part-1.

=====

In this Part-2, the dominant constraints to implement the enlarged Productivity are identified as Psychological, Social, Local, International, and Universal in nature. Their relative influences with reference to Input, Output, and Socio-Economic development acceleration, along with the utilisation of techno-commercial throughputs, are identified, and fitted into a Mathematical model. An algebraic approach to solve this Management-decision model infers that Decisions of Psycho-Techno-Commercial (PTC) intensive contents should be cautiously made. The relative influences of Social, Universal, International and Local constraints on Socio-Economic goals G and outputs O, should be pre-assessed and reduced to a possible minimum, as well as their influence should be assessed more critically on the former (G) than the latter (O). Bilateral Input Decisions relative to Socio-Economic development goals and Outputs should be pre-evaluated and well synchronised with unilateral Output Decisions.

The Optimum Management Decision is a favourable Ratio between pre-determined Socio-Economic Development goals to the Input Management Decisions, as well as the Ratio between pre-determined Socio-Economic Development goals to the Output Management Decisions, subject to a favourable ratio of Output Management Decisions to Input Management Decisions.

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Hence, the final redefinition of Productivity is a favourable Ratio between pre-determined Socio-Economic Development goals to the Inputs, as well as the Ratio between pre-determined Socio-Economic Development goals to the Outputs, subject to a favourable ratio of Physical outputs to Inputs.

These algebraic inferences are supported by the practical occurrences among various nations in different development brackets in the world.

The development of this model and the solutions are expected to indoctrinate an environment for better quality and standard of life among world population, through optimum integration of the research and development in the area of Economics, Science, Technology and Management, in line with the expectations of the human society from the dawn of the civilisation till the current millennium.

f = Function of Σ = Sigma (Summation)

07. EXTENDED PRODUCTIVITY LEAD.

Part-1 expanded the definition of Productivity to relate the inputs to Socio-Economic development goals, and to use the ratio of output to input as a peripheral guideline. This is developed based on the techno-investment concept of Harry.G.Johnson (1923 - 1979. Canada), presented in the 1977 Nobel symposium in Stockholm, Sweden, and discussion with accredited personal from various nations in the world, who are committed to accelerate the pace of Socio-Economic development. This enlarged Productivity concept is used as a guideline to develop a Management Decision methodology model, assuming a flexibly large number of Socio-Economic development goals, inputs and outputs. This enlarged the scope of Management-Decision area, and provided a lead to integrate the Management Decision process with the identification of constraints. This Part-2 is devoted to develop a Management-Decision model, solution and its interpretation, using a mathematical approach.

08. ASSESSMENT OF CONSTRAINTS.

In order to assess the constraints relative to the Socio-Economic development oriented Management Decisions, it is necessary to divide the world into two groups, namely those which are economically developed, and those in developing / under developed status.

In developed nations, the Management Decision-process are more flexible because of the following infrastructures:

1. As the achieved development provides adequate Biological (food, clothing and shelter), Psychological (ego, id), and Sociological (status, luxury) needs for the domestic population, the distracting variables to any productive operation are limited.
2. Because of exportable surplus commodities providing a base to barter for the local needs, strong local currency to exchange, and facility to exploit foreign labour, they could use the leverage of cheap-imports to bridge the domestic gap in the input resources.

Historically, the economically developed nations used the impact of industrial revolution during 1700s to replace manual labour with machines, and opened the channels of techno-commercial research, mass production and cost reduction. Subsequently, during 1900s, the world wars, dominated by the developed nations, utilised the techniques to analyse the occurrence relationship between targets and achievements, to develop a predictive-type of commercial models, in the from of Operations research . These two Management dimensions aided these nations to precisely quantify the inputs, outputs, through-put processes, time, and solve them towards optimum solutions, utilising the advancement in electronic technology. The sizeable budgets available to the planning and implementation process among developed nations, combined with these advanced techniques, not only sustained their developed status, but also bound the growth rate of the developing nations to that of theirs, during the last 100 years (Sir. Arthur.W.Lewis, Nobel prize paper "The slowing down of the engine of economic growth", December 1979).

These environments are not obviously true for the developing and under developed world. These regions, even-though economically weaker, are historically, culturally and spiritually stronger.

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These introduced a vicious dimension to the intangible (non-quantifiable) components and constraints to the area of Management Decision. Hence, any Management-Decision model applicable to the lesser developed world should well-fit within the dimensions of developed world, and the reverse may not be true in most of the cases.

Based on the enlarged Socio-Economic Productivity concept and its impact on Management-Decision process, discussed in Part-1, the goals G_1 to G_x are achieved through the outputs O_1 to O_m . These outputs in turn are generated from the inputs I_1 to I_n , acquired through input Management Decisions, related to manpower, materials, finance, technological conversion processes, and management facilities. Acquisition of these inputs should not violate the frame of reference of the Socio-Economic development goals. To the extent of the quantifiable limits, the technical systems could optimise the utilisation of inputs, and the commercial systems could optimise the planning, control and appraisal processes.

But the quantifiable dimensions of both technical and commercial systems do not provide any successful application guarantee to the following environments, peculiar to the developing and under-developed third world nations.

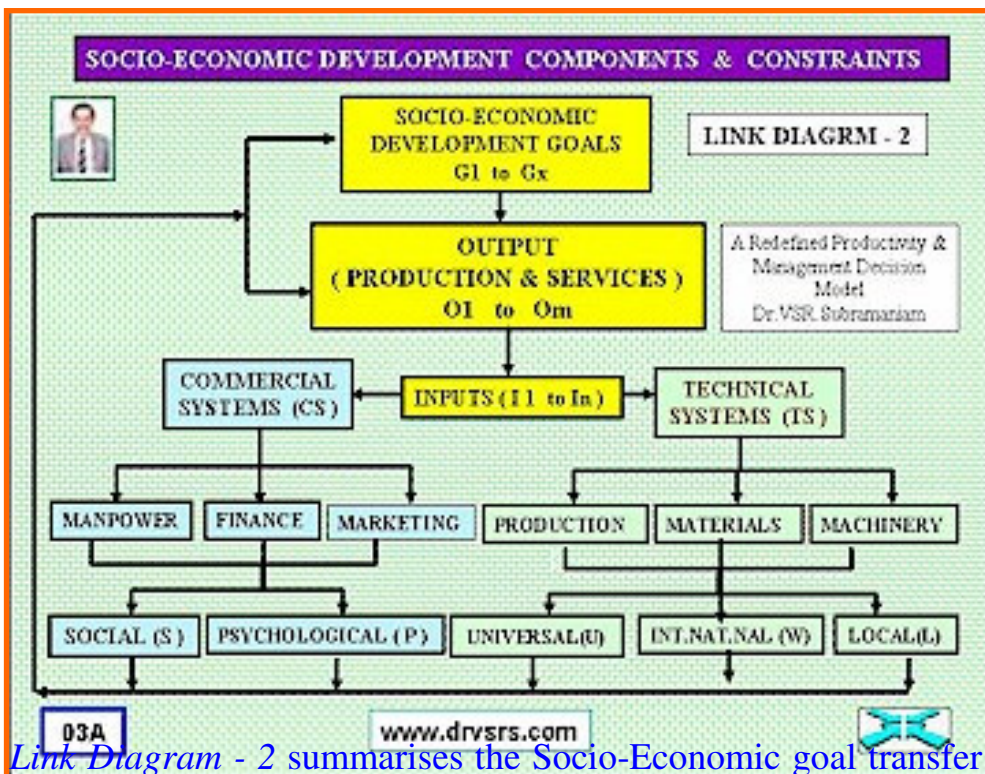
- A. The psychological behaviours P of domestic manpower, due to the limited education, poor economic background and deeply rooted philosophical outlook towards material wealth.
- B. The social influence S of the domestic groups controlled by their biological, geographic, linguistic, religious, and political diversities. These constraints impose limitations on the quantum outputs and Socio-Economic development achievements.
- C. All other inputs (non-manpower) are influenced by the following.
 - Local constraints L comprising village, district, state, and national level laws, restricting financial outlays, monopoly restrictions, price controls, import bans, export restrictions etc.... They also guide and control the output consumption, public distribution methods, taxes, and exercise a strong social-audit on corporate goals.

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- Impact of International politico-economic situations W, such as fluctuations in currency exchange rate, changing export demands, limitations in the availability of foreign know-how, machineries and materials, as well as cargo movement and travel limitations. These influence the output Decisions related to production priorities, pricing, product or service mix, warehousing, and transportation plans.
- Universal disturbances U in all parts of the world, such as cyclones, draughts, earthquakes, floods etc..., which drain the budgets intended for essential needs, affect the demand patterns, disturb the production and service priorities, and limit the supplies, movement of materials, personnel etc...

All these could exercise an intensive influence on the input / output Decisions, as well as the priorities on Socio-Economic development goals.

09. MANAGEMENT DECISION MODEL. (** means to the power)



**LINK
DIAGRAM-2**

Link Diagram - 2 summarises the Socio-Economic goal transfer through output / input Decisions to the Management aspects of the commercial systems CS , technical systems TS , and the relative influences of the four intangible constraints.

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As seen from this *Link Diagram - 2*, S, U, W, L respectively represent the Social, Universal, International (World), and Local constraints.

Using this schematic, it is mathematically possible to correlate the two systems, four intangibles, along with the psychological aspects P, to the Decision variables, relative to the goals GX , outputs Om , and inputs In, using the relational constants A, B, E, and coefficients of correlation a to v, as below :-

$$Om = f (DO) = A (S^{**}a U^{**}b W^{**}c L^{**}d)----- (11)$$

corresponding to the relationship (04) in Part - 1.

$$In = f (DI) =$$

$$B (S^{**}e U^{**}g W^{**}h L^{**}j) (P^{**}k CS^{**}l TS^{**}p) --- (12)$$

corresponding to the relationship (05) in Part - 1.

Also, the Socio-Economic goals Gx are influenced by the intangible constraints. This could be mathematically represented as

$$GX = E (S^{**}q U^{**}r W^{**}t L^{**}v)----- (13)$$

Hence, the enlarged Productivity, as a ratio between Socio-Economic goals and the inputs could be represented as

$$\Sigma \{ GX / f (DI) \} =$$

{ E (S^{**}q U^{**}r W^{**}t L^{**}v) } Divided by

$$\{ B (S^{**}e U^{**}g W^{**}h L^{**}j) (P^{**}k CS^{**}l TS^{**}p) \}$$

$$= \{ E / B (P^{**}k C^{**}l T^{**}p) \} \{ S^{**}(q - e) U^{**}(r - g) W^{**}(t - h) L^{**}(v - j) \}$$

$$= Y \{ S^{**}(q - e) U^{**}(r - g) W^{**}(t - h) L^{**}(v - j) \}---- (14)$$

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where $Y = \{ E / B (P^{**k} CS^{**l} TS^{**p}) \}$ ----- (15)

Output to Input peripheral ratio could be represented by

$f (DO / DI) = \{ A (S^{**a} U^{**b} I^{**c} L^{**d}) \}$ Divided by
 $\{ B (S^{**e} U^{**g} I^{**h} L^{**j}) (P^{**k} CS^{**l} TS^{**p}) \} > 1$
 $= \{ A / B (P^{**k} C^{**l} T^{**p}) \} \{ S^{**a-e} U^{**b-g} I^{**c-h} L^{**d-j} \}$
 $= V \{ S^{**a-e} U^{**b-g} I^{**c-h} L^{**d-j} \}$ ---- (16)

where $V = \{ A / B (P^{**k} CS^{**l} TS^{**p}) \}$ ----- (17)

Synchronisation of Output decisions to the Socio-Economic development goals is represented by

$\Sigma \{ Gx / f (DO) \}$

$Gx = f (DO)$ or $\{ E (S^{**q} U^{**r} W^{**t} L^{**v}) \} =$

$\{ A (S^{**a} U^{**b} W^{**c} L^{**d}) \}$ from (11) and (13). Hence,

$\{ A / E \} = \{ (S^{**q} U^{**r} W^{**t} L^{**v}) / (S^{**a} U^{**b} W^{**c} L^{**d}) \}$ or

$Q = [S^{**q-a} U^{**r-b} W^{**t-c} L^{**v-d}]$ ----- (18)

where $Q = (A / E)$ ----- (19)

From (15), (16) and (18), the following could be derived.

$[V / Y] = \{ A / B (P^{**k} CS^{**l} TS^{**p}) \}$ Divided by
 $\{ E / B (P^{**k} CS^{**l} TS^{**p}) \} = \{ A / E \} = Q$ ----- (20)

10. MANAGEMENT DECISION INFERENCES.

The guidelines set by the algebraic solution could be logically and systematically interpreted into different Management Decision directions, with reference to the expanded Socio-Economic development oriented Productivity model.

10A. SOCIAL RATE OF RETURN OVER QUANTUM RATE OF RETURN

Equations (15) and (17) are the constant of proportionality for the Socio-Economic development Productivity and Output to input relationship respectively. In both these equations, the coefficients of correlation k , l , p relative to Psychological, Commercial and Technical aspects appear in the denominator.

It implies that higher the values of k , l and p , then lesser the Socio-Economic Productivity as well as the ratio of output to input.

The developing world population is more elastic to philosophical, political, religious and other environmental disturbances, which attract and appeal to their psychology. Hence, psycho-intensive Management Decisions could lead to industrial unrest, strikes, and large-scale immigration of local skills outside the geographic boundaries (Village, State or National boundaries). Hence, cautious approach should be followed while making any psycho-intensive Decisions.

Also, over-intensive commercial or technical Decisions could either lead to an un-employment situation or inadequate adaptability of domestic households and local professionals to such mechanical environments.

The experience of multi-national Corporations among developing nations in Asia, to synchronise their mechanised and computerised operations with their headquarters in America or Europe, has caused many problems. The first is the psychological resistance to change attitude from the domestic management and labour class. The second aspect is from lack of social infrastructure to plan, process, utilise, update and optimise the use of both hardwares and softwares (of automated program controlled machines or computers).

The third impact is from the lack of local support both from the government and the labour unions. The local labour laws view the creation of unemployment by any corporate sector so seriously, to the extent that they even nationalise the sector, to maintain the minimum employment guarantee.

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The last impact is from the weak domestic currency in the international exchange market, which cannot buy even the cheapest machineries or softwares, available from economically advanced nations. This experience demonstrates a broad-spectrum coverage of the constraints out-lined in this model.

As per this model guideline, the solution is to view the mechanisation or computerisation as a techno-intensive investment decision, and apply it in phase, by considering the Social Rate of Return as more important than the Quantum Rate of Return. Then the Management action shall be to start with optimisation models, cost-reduction projects and Socio-Economic development oriented modules, and consider all other areas as low priority items in the mechanisation and computerisation process.

10B. SOCIO-ECONOMIC DEVELOPMENT OVER QUANTUM OUTPUT

The resultant Coefficients of correlation for Social, Universal, International and Local environments in equation (14) and (16) are expressed as ($q - e$), ($r - g$), ($t - h$), ($v - j$) and ($a - e$), ($b - g$), ($c - h$), ($d - j$) respectively. This implies that both the Decisions related to Socio-Economic-Development, Productivity and Output to Input ratio could be favourable, only if

{ $e > a$ and q } , { $g > b$ and r } , { $h > c$ and t } , and { $j > d$ and v }

This provides a relational guideline on Social, Universal, International, and Local (SUWL) constraints on the three Management Decision areas.

a , b , c and d relate their influence to Output Decisions e , g , h and j relate their influence to Input Decisions. q , r , t and v relate their influence to Socio-Economic-Development goals. These algebraic derivations infer that the relative influence of these four (SUWL) intangible constraints should be ensured that it is less in both Output and Socio-Economic-Development goals formulation than the Input area.

Hence, the Management Decisions sequence should be :

- Stabilise the Socio-Economic-Development infrastructure of the operation first, by optimally utilising the available inputs to produce the basic-need outputs.

- Secondly, after an acceptable level of Socio-Economic-Development stability, plan the output upgrades, by properly synchronising the domestic and imported input supplies.
- Thirdly, improve the domestic input supplies to attain a full self-sufficiency level.

By following this sequence, the influence of intangible constraints on Socio-Economic-Development goals and outputs are tackled at first, and reduced to a minimum. Subsequently, when the input upgrade decisions are under implementation, the relative influence of these intangible constraints will be either negligible or even nil .

Japan is a good example which adopts a bottom to top Decision-pooling technique in all productive operations. This is a built-in methodology to avoid the psychological resistance to change attitudes, post-implementation social problems, and divergent group-interests among the local communes, as well as the unforeseen set-backs at the international level and unexpected calamities due to universal disturbances. They are met jointly with moral and physical courage. Their techno-commercial superiority in the world, inspite of the lack of domestic oil and steel, and inadequate land area to house giant-size projects, is because of their management methodology in line with this model.

10C. INTANGIBLES OVER TANGIBLES

When the Social, Universal, International, and Local constraints are related and graded between Socio-Economic-Development and output Management Decisions, their relative correlation coefficients appear as ($q - a$), ($r - b$), ($t - c$) and ($v - d$) respectively, in equation (18). This infers the occurrence of optimum synchronisation between Socio-Economic-Development and output Management Decisions, only when $q > a$, $r > b$, $t > c$, and $v > d$. It means that the Socio-Economic-Development oriented Decisions are relatively guided intensively by these four intangible constraints, than output Management Decisions.

Some developing nations in Asia, motivated by their interest to substantially increase the domestic quantum production capability, than their Socio-Economic-Development goals, nationalised the large-scale multi-national petroleum, chemical and research-intensive electronic industries. This is obviously contradictory to this algebraic inference.

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Subsequently, these developing nations are forced to either invite back the multi-national management teams of these nationalised sectors, or open these sectors to private operators. This is because of these following environments :

- a. Even-though the output quantum production capability of the sectors were adequate at the time of nationalisation, the social infrastructure to support, manage, and produce "quality" outputs to meet the domestic and export standards, were absent.
- b. Technological security and safety standards were sacrificed by the outdated and traditional government management, in the post-nationalisation period. The market leadership of these sectors deteriorated, and non-adherence to public health standards resulted in environmental pollution, causing problems to large volume households around, as well as the in-house labour.
- c. Lack of international research and development facility and closure of avenues for the exchange of experiences, kept their products and services outdated within their nation, and obsolete in the international market.
- d. Techno-intensive local skills developed within these sectors, migrated to comparatively developed nations abroad, looking for opportunities to optimally utilise their skills, and get adequate incentives for their know-how.

These current situations among developing nations support this algebraic inference of the Management-Decision model.

10D. BILATERAL INPUT AND OUTPUT INTEGRATION

The ratio A/E is equal to the ratio V/Y is derived in equation (20). The inference is that the bilateral Input Decisions relative to both Output and Socio-Economic-Development Productivity (represented by V/Y), should be equally balanced by output Decisions (unilateral dimension) towards Socio-Economic-Development goals (represented by A/E).

It means that any nation directing their efforts towards self-sufficiency and self-dependency through proper infrastructure to deliver the output products and services, should also pre-evaluate their implications on input resources relative to

- a. The feasibility to develop and maintain the supply of input Materials, Machinery, Management and Productive skills from domestic sources. This is represented by $[Gx / ((DI)]$ should be optimum

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- b. Impact on output products and services to supply them at economically justifiable costs and socially acceptable quality. This is represented by [$G_x / (DO)$]

Thus the input should serve in such a way to assist the Socio-Economic Development goal optimisation as well as Productive Output. In addition, the Output should also be oriented towards Socio-Economic development optimisation.

The Optimum Management Decision is a favourable Ratio between pre-determined Socio-Economic Development goals to the Input Management Decisions, as well as the Ratio between pre-determined Socio-Economic Development goals to the Output Management Decisions, subject to a favourable ratio of Output Management Decisions to Input Management Decisions.

Hence, the final redefinition of Productivity is a favourable Ratio between pre-determined Socio-Economic Development goals to the Inputs as well as the Ratio between pre-determined Socio-Economic Development goals to the Outputs, subject to a favourable ratio of Physical outputs to Inputs .

11. CONCLUSION.

Money is the medium of exchange for wealth, and its usefulness to the domestic society is attained when it is pooled and productively utilised as a Capital investment . Technology is a medium of conversion for the generation of utilisable output goods and services, from the input resources. Management is a methodology to match and optimise the productive utilisation of both money and technology, to serve their optimum purposes, towards a broad-based Socio-Economic-Development goals. Socio-Economic Development is the cumulative upgrade in the standards of living and peaceful co-existence between different groups and societies within a nation.

Thus, the tangible wealth and intangible technology are inter-tangled to serve their productive purposes by the Management-Decision methodology, terminating at the Socio-Economic-Development offspring. The effectiveness of all these three ingredients should hence be evaluated with reference to the ultimate end-use, namely the Socio-Economic-Development.

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With this in view, the Productivity, which measures the effectiveness of all the inputs with the outputs is redefined to reflect their contributions towards the Socio-Economic-Development goals, with an advantageous output generation potential. The Management Decision process, which designs, implements, and monitors these productive achievements, need proper directive orientation, with reference to this enlarged Socio-Economic-Development Productivity model.

Development of an algebraic Management-Decision model and its solution leads to the conclusion that

- There is a need for cautious approach to the psycho-techno-commercial intensive Decisions.
- Consider Social return as more important than quantum returns.
- Pre-assessment and control of the influence of social, universal, international, and local constraints on Socio-Economic-Development and output { with more emphasis on the Socio-Economic Development than on Output }.
- Bilateral synchronisation of inputs and outputs with reference to Socio-Economic-Development goals.

The practicality of these inferences are obvious from the experiences of various nations in the world, in different Socio-Economic-Development brackets. As per historical guidelines,

Nomenclature is mere identification. Expression is greater than the name (nomenclature). Innovation is greater than the expression. Execution is greater than the innovation. Results are greater than execution. Knowledge updating and perfection is greater than results. Improved utilisation is greater than the knowledge. The highest level of utilisation is their unification into the Life and make it Valuable.

Source : The Chandogya Upanishad from the Hindu "Sama Vedham" Chapter 7, Section VII, Verse 1.4 (Ancient Sanskrit astro-scientific scripture dated back to about 1500 B.C)


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Economics and other sciences in the world developed different concepts, and designated them with different nomenclatures. The research and development activities innovated and propagated their advancements. Technology executed them to produce tangible and intangible results, updated them and perfected them through feed-back systems. Management utilised the improve systems gained from all these processes. Ultimately, they should serve the betterment of the value of life of people in the national and international society.

This expanded Productivity and management-Decision model, the algebraic solution and their interpretation is a magnificent attempt towards this vicious Socio-Economic-Development upgrade in the new Millennium.

SUMMARY OF FINDINGS

Productivity & Management





www.drvsrs.com

**A Redefined Productivity Model &
Socio-Economic Development Oriented
Management Decisions
BY : DR.VSR.SUBRAMANIAM**

In the Domain of Development Economics,
Productivity is represented by **Output** to **Input** Ratio &
Management Decisions related to the **Inputs** and
Outputs ensures to keep this ratio in a favourable
condition. When this is **integrated** with a **Broad-Scope**
of **Socio-Economic Development (SED)**.

- ❖ **Qualitative** aspect of **Output & Input Management Decisions** are to be evaluated with reference to
 1. **SED Goals** for a favourable condition.
 2. **Intangible** aspects are given a higher priority than **tangible** aspects.

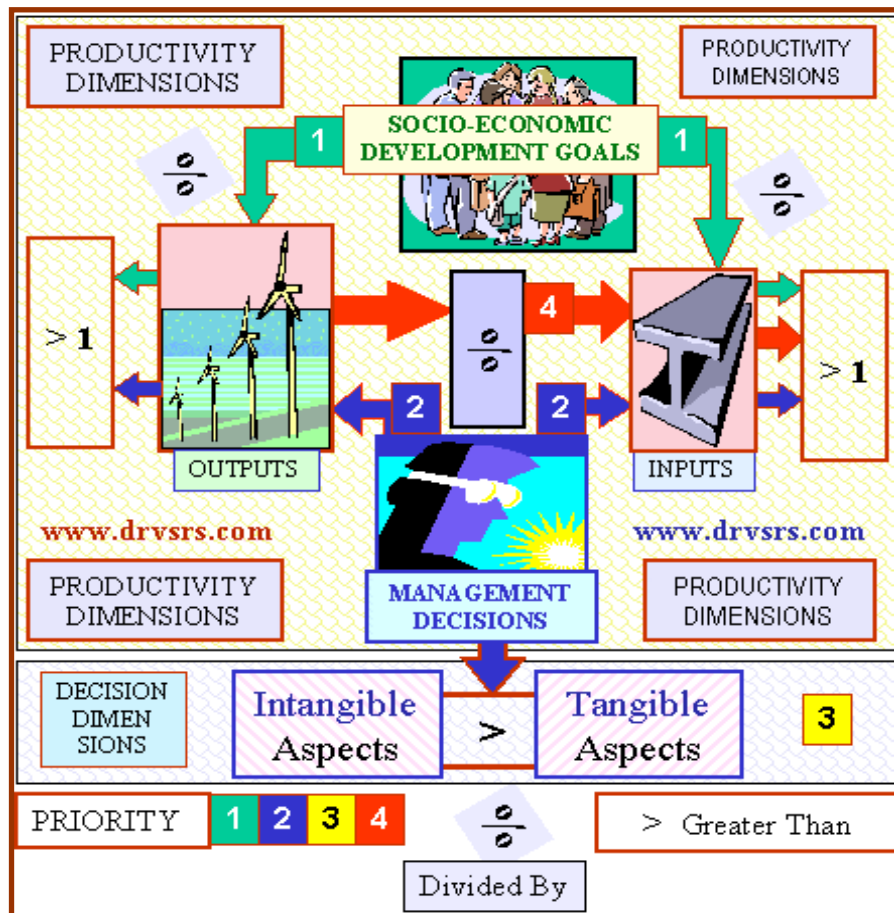
- ❖ **Quantitative** aspect of **Output & Input** are to be evaluated with reference to :
 1. **SED Goals** for a favourable condition &
 2. **Output to Input Quantum** ratio also for a favourable condition.

PRODUCTIVITY & MANAGEMENT DECISION MODEL

SUMMARY OF CONCEPTS

- ❖ **PRODUCTIVITY = SED GOALS / INPUT > 1 & SED GOALS / OUTPUT > 1**
SUBJECT TO OUTPUT / INPUT > 1 (SED = SOCIO-ECONOMIC DEVELOPMENT UNITS)
- ❖ **SOCIAL RATE OF RETURN IS IMPORTANT THAN QUANTUM RATE OF RETURN.**
- ❖ **INTANGIBLE ELEMENTS ARE IMPORTANT THAN TANGIBLE ELEMENTS. (PSYCHO-SOCIO-INTER NATIONAL-UNIVERSAL)**
- ❖ **MANAGEMENT DECISIONS ARE OPTIMUM WHEN**
SED GOALS / INPUT DECISIONS > 1 &
SED GOALS / OUTPUT DECISIONS > 1,
SUBJECT TO OUTPUT DECISIONS / INPUT DECISIONS > 1
- ❖ **Universally Applicable to All Developed/Developing/Under-Developed Nations**

CONCEPT SCHEMATIC DIAGRAM



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LEGENDS

CS	Commercial Systems	Coefficient of Correlation with reference to DI is l	
DI	Decisions on Input	B - Constant of Correlation with reference to L, S, W, U	
DO	Decisions on Output	A - Constant of Correlation with reference to L, S, W, U	
G	Socio-Economic Development goals	1 to x	E - Constant of Correlation with reference to L, S, W, U
I	Inputs (1 to n)		
L	Local (Domestic) disturbances	Coefficient of Correlation with reference to DO is d, DI is j , G is v	
O	Outputs (1 to m)		
P	Psychological constraints	Coefficient of Correlation with reference to DI is k	
PG	Productivity relational to Socio-Economic Development (1 to z)		
Q	A / B	V / Y	R
	Output to Input ratios (1 to y)		
S	Social disturbances	Coefficient of Correlation with reference to O is a , DI is e, G is q.	
TS	Technical Systems	Coefficient of Correlation with reference to DI is p	
U	Universal disturbances	Coefficient of Correlation with reference to DO is b, DI is g, G is r	
W	International (World) disturbances	Coefficient of Correlation with reference to DO is c , DI is h , G is t	
V	Correlation constant between Output and Input Decisions, relative to P, CS, TS		
Y	Correlation constant between Socio-Economic Development goals and Input Decisions, relative to P, CS, TS.		

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- April 2000 - Pages 36 to 38, May 2000 - Pages 44 to 48,
June 2000 - Pages 43 to 44, July 2000 - Pages 42 to 44.

2. Mrs. Gandhi Gave New Economic Approaches.

- Barbados Advocate (Daily News Paper), Barbados, West Indies.
- January 8, 1985. Page 4 - Centre Page Article.

3. Corporate Infrastructure for 5th Generation Computers.

- INDIAN MANAGEMENT, Journal of the All India Management
Association.
- June 1985 - Pages 19 to 28.

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4. Other Past Publications : (In various Indian and International Journals)

- Economic Science & Management - 10,
- Manpower Management - 8
- Materials Management - 3
- Productivity - 2
- Resource Optimisation - 8
- Research & Development - 4
- Training Management - 2.

SOURCE : AUTHOR'S WEB-PAGE	www.drvsrs.com/mgmtfull.htm
ABOUT THE AUTHOR	www.drvsrs.com/drvsrs.htm
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AUTHOR'S RESEARCH & DEVELOPMENT	www.drvsrs.com/nobel.htm
AUTHOR'S CONCEPT SUPPORT	www.drvsrs.com/fldsupport.htm
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BOOK STORE	www.lulu.com/drvsrs
THEME PRODUCTS	www.cafepress.com/drvsrsthemes/

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RESEARCH & DEVELOPMENT ACTIVITIES OF THE AUTHOR

The Author was awarded the Ph.D. in Management in 1975, by the University of Bombay, India. His was the first Ph.D, ever awarded, after the inception of the subject, by the University. Thesis was on Productivity & Management Systems - Evaluated by the University of Bombay, Indian Management Experts and Manchester Business School, UK.

01. POST-DOCTORAL ACTIVITIES

ASSOCIATIONS, COMMUNICATIONS, DISCUSSIONS, RESEARCH AND DEVELOPMENT DIALOGUES FOR NEW RESEARCH CONCEPTS DEVELOPMENT WITH THE FOLLOWING (Contact Dates in Bracket)

A. NOBEL LAUREATES IN ECONOMIC SCIENCE (1984 to 1991)

- **ARTHUR LEWIS [SIR] , New Jersey , USA .
(Laureate of 1979)**
Former President of the Caribbean Development Bank, Barbados, West Indies.
AWARDED FOR : Pioneering Research into Economic Development with particular consideration of the problems in Developing Countries.
- **JAMES E MEADE , Cambridge , UK . (Laureate of 1977)**
AWARDED FOR : Path breaking contribution to the theory of Inter-national Trade and Inter-national Capital Movements.
- **JAN TINBERGEN, Haviklaan , Netherlands.
(Laureate of 1969)**
AWARDED FOR : Developed and applied Economic Models for the Analysis of Economic process.
- **JOHN R HICKS [SIR] , Oxford , UK and
KENNETH J ARROW , California, USA . (Laureates of 1972)**
AWARDED FOR : Pioneering contributions to General Economic Equilibrium Theory and Economic Welfare Theory.

B. INTER NATIONAL SOCIO-ECONOMIC DEVELOPMENT INSTITUTIONS

- **SECRETARY GENERAL** : (1982 to 1986)
COMMONWEALTH , Pall Mall , London , UK .
- **PRESIDENT** : (1982 to 1986).
CARIBBEAN DEVELOPMENT BANK
(World Bank / UNDP Setup) , Wildey , St . Michael , Barbados .
West Indies .

C. SOCIO-POLITCAL DEVELOPMENT PERSONALITIES

- **Mervyn.M.Dymally** : (1984 to 1994)
A Progressive Democratic Congress Man of the 31st District
(California), from 97th (1981) to 101st (1993) Congress of the United
States of America. Lieutenant Governor of California from 1975 to
1979.
- **Indira Gandhi** : (1975 to 1983)
Prime Minister of India , New Delhi, India
- **Kadayam.S.Madhavan** : (1955 to 1966)
Community Economic Development Proletarian (Self-less worker),
Philanthropist, Rural Agriculturist, Social Development / Unity
Worker, and Village Educationist. From a village called Kadayam in
Tirunelveli District, Tamil Nadu, India. Lived from late 1800's to late
1900's.

02. POST-DOCTORAL PRIME-PUBLICATIONS

Accredited, Promoted and Propagated for view from :-

Ω Research Papers in Economics (www.repec.org).

Ω Social Science Research Network (www.ssrn.com).

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Over View. See in : www.drvsrs.com/polifina.htm**

DR.VSR.SUBRAMANIAM



CREATIVE CONFERENCE

1. OSWALD YHAP - Manager,
Caribbean Basin Water management
(CDB)

2. DR.VSRS 3. ARTHUR LEWIS
Nobel Laurate in Economic Science 1979.
In Welches Gardens, St.Michael, Barbados.
West Indies on Saturday the April 20, 1985

ACCREDITED ASSOCIATION

DR.VSRS WITH ARTHUR LEWIS
Nobel Laureate in Economic Science
1979
In the University of West Indies.
Barbados Campus

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VIEWER'S FEEDBACK Source : www.drvsrs.com/viewers.htm
Management Feedback 01

Dr.Malvyn Copen, Professor in Management Science, Boston, USA. February 4, 2002. { TOPIC : MANAGEMENT }

One of my research assistant in recent Economic development theories, got a link to your Website. I read your paper on "A Redefined Productivity Model and Socio Economic Development oriented Management Decisions"

The paper even though uses a very complex algebra, ends with a summary that the Productivity has to be a ratio of Socio-Economic Development Units divided by the quantity of Inputs, Outputs; as well as the ratio of Socio-Economic Development Units divided by the Input management decisions, Output management decisions.

My question is how to quantify

1. The Socioeconomic Development goals.
2. The Input Management Decisions.
3. The Output Management Decisions.

I am looking forward to your earliest reply to the same email address, as we are working on a research project on effective management tools for government sectors in developing countries.

My Reply

I am extremely happy to know your critical interest to decipher and refer my concepts in Productivity and Management Decision, in your research work. Now we are in a millennium which is digitising the Musical recording and TV transmissions, which were considered as an exclusively analogue area till 1990s. Equally, anything in Management and Socio-economic area can be digitised and quantified. World war 2 experiences introduced the concept of "Operations Research" to build mathematical models for optimising management decisions. Similarly the "Econometrics" providing the use of mathematics, has become an area of specialisation in the faculty of Economics, considered for decades as an abstract and theoretical subject. Jan Tinbergen of Netherlands was a pioneer in the development and application of Economic models in Economic Analysis. He was awarded the 1969 Nobel prize in Economic science.

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Now, let me answer your questions. Here I provide the exhaustive details on how every aspect of Socio-Economic Development, Management Input / Output factors could be quantified, in order to assist your research project.

1. The quantified aspect of Socio-Economic development goals are :-

- Number of employment provided by sector.
- ❖ Per capita consumption of food grains.
- ❖ Fare paid by the population per Bus-Kilometer.
- ❖ Per capita consumption of Pure water.
- ❖ Per capita availability of clothing materials.
- ❖ Per capita availability of constructed living space.
- ❖ Per house-hold availability of essential drugs.
- ❖ Per acre availability of Fertilizer.
- ❖ Production of Essential / Luxury / Controlled Items per Kilowatt Electric Power.
- ❖ Number of house holds having Electric / Gas / Telephone links per Square Kilo meter etc....
- ❖ These could be cumulated from Per capita / Per House-hold to District, State and National level.

2. The quantified aspect of Management Input Decision are :-

- ❖ Man-hour spent in Raw material purchases separated by Essential / Luxury / Controlled items.
- ❖ Man-hour spent in material purchase meetings separated by Essential / Luxury / Controlled items.
- ❖ Man-hour spent in new designs / design modifications separated by Essential / Luxury / Controlled items.
- ❖ Man-hour spent per employee recruitment.
- ❖ Travel hours per supplier quality verifications separated by Essential / Luxury / Controlled items etc...
- ❖ These could be cumulated by Division, Department, Functional unit, and the Total Corporate / Government Group or sector etc...

3. The quantified aspect of Management Output Decisions are

- ❖ Man-hour spent in Sales separated by Essential / Luxury / Controlled items.
- ❖ Man-hour spent in sales promotion meetings separated by Essential / Luxury / Controlled items.
- ❖ Man-hour spent in new product launching separated by Essential / Luxury / Controlled items.

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- ❖ **Man-hour spent per customer contacts separated by Essential / Luxury / Controlled items.**
- ❖ **Travel hours per customer sales / collection separated by Essential / Luxury / Controlled items etc...**

These could be cumulated by Division, Department, Functional unit, and the Total Corporate / Government Group or sector etc.....

This Letter also may of Interest to you. Please Click on this : [Angello Bocelli](#)

Source : www.drvsrs.com/viewers.htm

Management Feedback 02

INSTITUTE OF CHARTERED FINANCIAL ANALYSTS OF INDIA.

Hyderabad. India. Professor Navin Das, Consulting Editor, ICFAI Journal of Managerial Economics. May 5, 2004. Topic ; Management.

The Institute of Chartered Financial Analyst of India (ICFAI) is a non-profit organization involved primarily in providing distance education, offering professional and undergraduate programs in Investment Banking, Portfolio Management, Treasury Management, Insurance, Banking and Accounting. Economics is a major subject in the above programs. We continuously upgrade our material integrating various contemporary issues in the courseware.

In our pursuit of academic excellence in higher education, we are continuously publishing monthly magazines and journals in various areas. The Chartered Financial Analyst, Treasury Management, Insurance Chronicle, Professional Banker, Effective Executive, HRM Review, Case Folio, Journal of Applied Finance, Journal of Applied Economics, Journal of Organizational Behavior, Journal of Corporate Governance, Journal of Intellectual Property Rights, Journal of Cyber Law and Journal of Business Law are a few titles of some of our magazines and journals. All our magazines contain both original (contributed by the editorial team) and reprinted articles.

Similarly, we have made a humble beginning in the field of Economics too. We have brought out a journal as ICFAI Journal of Managerial Economics. In this regard, we wish to seek your permission to reprint your paper entitled, “A redefined productivity model & socio-economic development oriented management decisions”.....

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My Reply

I am happy to find that the Institute of Chartered Financial analysts of India is adding value to the analytical approach by reinforcing / integrating the concepts of Managerial Economics. I wish that the concepts of Sociology is also given equal importance, in addition.

During my assignment with the Commonwealth Fund for Technical Co-operation (CFTC), London, UK and the Caribbean Development Bank (CDB. An UNDP/World bank setup for Regional Development), Barbados, West Indies, I found that the Developing and Under-developed nations are either stagnant or slide downwards, in their status. Hence I was eager to find concepts to drastically tune the development acceleration of these nations. The result of my association and discussions on this prime matter with 5 Nobel Laureates in Economic Science, President / Secretary Generals of International Development Institutions, Progressive Congressmen of the United states, Prime Ministers of the Member nations and Independent Socio-Economic development workers, resulted in the production & publication of this paper.

I found and introduced the need to analyse, evaluate and justify the development projects prior to approval as well as post implementation stage, under 4 Rate of Returns

- 1. Economic (Living standard adequacy of primary needs & household saving capability).**
- 2. Financial (Investment).**
- 3. Technical (Capability to develop and use advanced technology).**
- 4. Social (Employment promotion, Domestic know-how utility, Happiness, Peace and Prosperity).**

This resulted in the drastic re-definition of the concept of Productivity and associated re-orientation of Management Decisions at the Government & Private levels of Administrative control.

A country like India evaluates the Investments in Agriculture, Communication, Transportation etc... in unilateral Financial Rate of Return; Atomic / Space exploration projects in unilateral Technical Rate of Return.

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The Economic and Social Rate of Return are completely absent. Satisfied with these limited evaluation, the nation claims that it has made strides in Development.

Actually India is visibly slipping from Developing to Under-developed status (Population expansion also pulls the Percapita income downward by acting as a diving denominator to divide the GNP). As a result, India has become a source for the supply of high quality products / raw materials at cheaper rates, and high-know-how/tech/skill Manpower supply pool at lower wages, to the developed world. This environment assist the developed nations, to sustain their advanced status, as well as to develop them further at the cost of Developing / Under-developed nations, including India.

On the other hand, an advanced nation like US attach priority / importance to Economic and Social Rate of Return for every aspect of their projects and investments, keeping the Financial and Technical frames as secondary. The impact of this Management Decision orientation is obviously visible from the standard of living, happiness, saving capability etc.. of the Developing / Under-developed population, who migrate into US/Other developed nations. (Please note that un-social behaviours, thoughts and acts are not part of these population. It originates due to over-wealth & terrorist minded personnel, who are present in all nations). Feed back to my concepts from US also confirms that if they shift their Evaluation and Decision priority, they will start slipping towards Developing and Under-development status. The lesson is very simple, and any Developing/Under developed nation can also do it !!!

I am sure the broad-based view of your Institution will contribute towards a different and practical view of Productivity, and re-orient the Management Decision methodology accordingly.

You may be benefited if you could please see these Pages also in this Website Development Acceleration. Mrs Gandhi's Economics. Politico Financial Over View.

These Letters also may of Interest to you. Please Click on this :

Angello Bocelli Dr.Malvyn Copen

DR.VSR.SUBRAMANIAM

Source : www.drvsrs.com/viewers.htm

Productivity Feedback

Angello Bocelli, Workshop Owner, Voghera, Italy.

24th November 2001. { TOPIC : PRODUCTIVITY }

I have one engineering work shop. I produce parts for machine and automobile industries in Milano and other near places in Italy. I am a sub contractor.

I check my workshop ability and productivity by how much I put in versus how much I get out. I use money value and quantity value both. I am a private business man.

You talk of productivity by Socioeconomic goals. What it has to do with me ?

My Reply

Every business in a country is directly or indirectly connected with Social and Economic conditions. You produce parts and supply. You have to make profit and grow. This is a business angle.

But you are also indirectly contributing to the social and economic areas of the country. They are :-

- ❖ Providing employment to local population.
- ❖ Improving the technical knowledge of the workers.
- ❖ Employee welfare and health care.
- ❖ Helping the industries you supply to export and earn foreign exchange.
- ❖ You pay taxes and duties to the Government etc.....

As a business man, you check your industry's Productivity with reference to money and quantity input and output. But at the same time find out how much of your Productivity are contributing to the Social and Economic development area also.

DR.VSR.SUBRAMANIAM

- ❖ **Number of people employed over the years with reference to your output quantity and the average in your type of industry.**
- ❖ **Contribution to the employees' income and health facilities with reference to output quantity and the average in your type of industry.**
- ❖ **Export earned by your customer industries with reference to your sales over a year.**
- ❖ **Tax and duty paid with reference to your sales over a year.**
- ❖ **Etc.....**
- ❖ **You can compare these over different years and see whether they are increasing or decreasing.**
- ❖ **Unless every industry think and do something about this, the nation cannot survive, continue and progress.**

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