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ACCELERATE YOUR SOCIO-ECONOMIC DEVELOPMENT AN ECCENTRIC BI-CIRCULAR MODEL & SOLUTION (GEOMETRIC MODEL)

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DR.VSR.SUBRAMANIAM

ACCELERATE YOUR SOCIO-ECONOMIC DEVELOPMENT AN ECCENTRIC BI-CIRCULAR MODEL & SOLUTION

PART - 1 BACKGROUND TO DESIGN A MODEL

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EXECUTIVE SUMMARY

Backed by my assignments with international Socio-Economic development institutions, and accredited scholarly associations, I developed a thirst to design a practical model to accelerate the pace of development of the third world nations.

The world is divided into many categories, and the prime classification is the "Economic" bracket, as "Developed or Developing or Under developed". In the history, we are yet to see a country in the developing and under-developed category, moving upward into a developed category.

This stagnated condition of the world nations was correctly identified and questioned by the Nobel Laureate in Economics (1979), Sir. Arthur Lewis (1915-1991.St.Lucia/UK. Princeton University, Newjersey, USA) as "Is the dependence of the developing country world growth on that of the developed - world inevitable ?". Using this question, as a base, this paper is prepared and presented in two parts.

As described by the Nobel Laureate, the constraints on a break-even growth of the developing world are, their rate of population expansion, non-homogeneity of their industrial infra-structure, competition versus their economy of operation, and low demand for raw-materials among themselves**.**

Part-1, is providing adequate background to develop a model towards an "Economic Management" guideline, to make this linkage more eternal than inevitable. This part comprehensively attempts to identify the factors to create a pre-condition to overcome these constraints among the developing world.

The starting strategic approach is to "strengthen" the inter- group relationship, through the development of "social infrastructure", in order to utilise their productive capability. Then to "smoothen" the inter-country differences, through appropriate techno-commercial upgrade, in order to improve their linkage, and co-operative efforts.

Social infrastructure is developed through an upgrade in tangible "economic satisfaction", and intangible "social comfortability" of individuals, to motivate domestic savings as well as to improve the quality of domestic human potential, which cumulatively contribute towards the national development.

The techno-commercial infrastructure upgrade is achieved through methods to promote domestic investments and domestic technology. Both these are maintained and monitored by the optimum infrastructure mix.

From a productive angle, Gross National Product is an aggregate of each national sector products, which is the net of their resource productivity and the productivity constraints. Techno - commercial systems assist to reduce the effects of these constraints, develop the technology, and optimises the resource utilisation. These aspects in turn, create cost / wastage reduction, remove excess holding, reinvestment opportunities and motivate domestic innovations and skills.

But, these logical steps are vicious to implement. Hence, it is necessary to simulate a mathematical model, solve and interpret the results into implementable decisions. Through these inferences, this paper provides a "lead" to Part-2, for designing a mathematical model and its solution .

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

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01. ETERNAL LINKAGE

" **For the past 100 years, the rate of growth of output in developing world has depended on the rate of growth of the developed world. Is this linkage inevitable ?** "

This was a question raised and the problems were tackled through an economic approach by Sir. Arthur Lewis (1915-1991. St.Lucia/UK. Princeton University, Newjersey, USA. Nobel Laureate of 1979) who was the President of the Caribbean Development Bank, Barbados, WI, where I had an assignment), in his Nobel prize paper in economic science "The slowing down of the Engine of Growth", during December 1979.

The possible solutions suggested by the Noble Laureate for an independent rate of growth of the developing world are :

- Adopt appropriate agrarian policies, cultivate better crop varieties, and introduce modern agricultural methods, so that each nation can feed themselves. But, it could workout only if the birth rate is brought below 20 per 1000.
- Follow the customs union rate with preferential trade terms to developing world as per the "Protocol Relating to Trade Negotiations among Developing Countries (1973)". The limitations of this route are :-

  - Non-homogeneity of the developing country industrial infrastructure.

  - Role of competition between industries of economies of scale, within each developing nation.
  - Decreasing trend in the cost of transportation among the developed world, which easily attracts the commodities in developing nations in large volume, towards the developed national demand. This also drains off the essential needs of the domestic population, and deprives their legitimate consumption and satisfaction.
  - Development of inter-developing-country production and trade links. Limitation of this method is the low demand for raw and basic materials among developing nations, and high demand for the same in the developed world.

The objective of this paper is to analyse the preconditions necessary to create the surroundings in the developing world to attain a self-sustaining growth, and obviate the limitations. Through this approach, it is also expected to optimise the speed of the engine of growth among developing world, through internal socio-economic development steam generation.

02. STRATEGIC APPROACH

A review of the current developing world situations indicate the need to adopt two distinct approaches towards Social and Economic development.

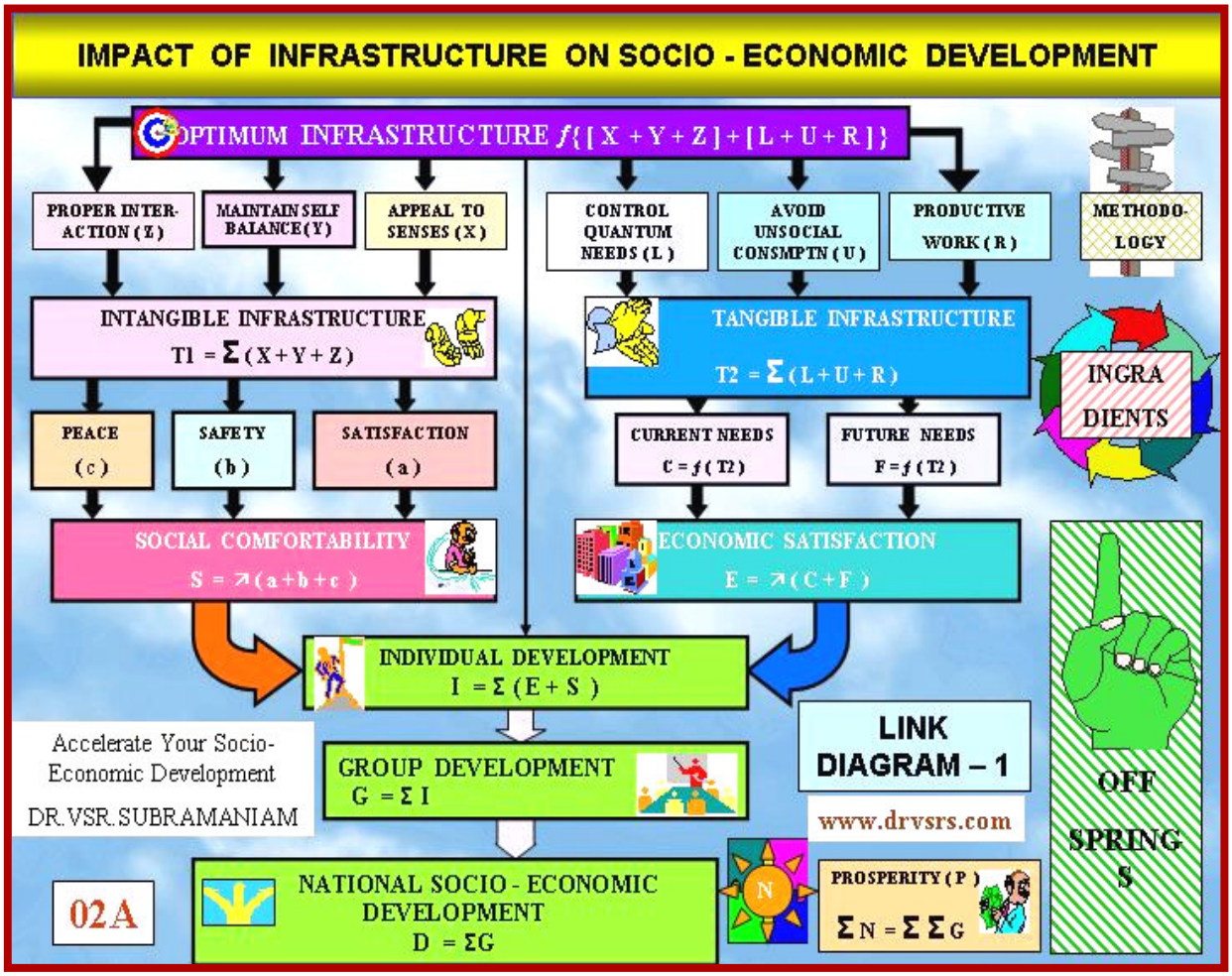
In my opinion, the approach to **strengthen** the social harmony and **smoothen** the inter-country relationships, may prove to be more **strategic** and **feasible**.

By this approach, the former could generate a congenial co-existence and the un-quantifiable Intangible social infrastructure **T1**. The former motivates the local entrepreneurial skills, and the latter could lead to the creation of industries of common economies of scale between groups of nations.

These groups could produce and trade, to meet their mutual self-sufficiency, and export the surplus to the developed world. In short, it could generate a pre-condition to the route of demand and supply, between the developing and the developed world, as well as decide and direct the developing national production, on an on-going basis. This constitutes the quantifiable Tangible Economic Infrastructure **T2**.

02A. INTANGIBLE INFRASTRUCTURE (T1)

LINK DIAGRAM – 1



The three components of the un-quantifiable or intangible infrastructure **T1** are cumulatively moderated by the relative appeal to the senses of the individuals **X**, maintenance of their self-balance **Y**, and constructive interaction between them **Z**, or

$$T1 = \Sigma (X+Y+Z)$$

T1 in turn is related to the social comfortability of each individual. Social comfortability of an individual **S** is also a cumulative feelings of their satisfaction as honourable members of the society **a**, safety and ensured availability of the essential needs of life **b**, and peace **c** to reduce psychological tensions and fears of war and destruction. Or

$$S = \sum (a + b + c)$$

The Intangible infrastructure is derived from the optimum infrastructure mix of **a**, **b** and **c**, and contributes to the individual development through the medium of Social Comfortability. This is shown in the **left half** of ***Link Diagram -1***.

02B. TANGIBLE INFRASTRUCTURE (T2)

In all the developing nations, the domestic population expect a tangible infrastructure beyond the provision-capacity of their given socio-economic status. Hence, any tangible infrastructure development should aim at orienting the quantum consumption of the various commodities within a permissible limit **L,** avoidance of hoarding / unsociable methods **U** (to eliminate excess acquisition or consumption), and create a productive work environment **R**. This is to introduce the concept of optimum output quantity and quality of goods, for a given input. The tangible infrastructure is a function of the cumulative effect of these three basic ingredients, or

$$T2 = \sum (L + U + R)$$

This tangible infrastructure **T2** is closely related to the economic satisfaction **E** of each individual, namely the food, shelter, and clothing, and it is the relative influence of their current needs **C**, and their future needs **F**, with reference to the degree of satisfaction and psychological (ego and id) motivators, or

$$E = \sum (C + F)$$

Both the current and future needs are a function of the tangible or quantifiable Environmental infrastructure **T2** or $C = f (T2)$ and $F = f (T2)$. This is shown in the **right half** of ***Link Diagram -1***.

02C. OPTIMUM INFRASTRUCTURE MIX

The Optimum infrastructure mix for a nation is hence made up of the cumulative effect of the contributory factors of both the Intangible aspect **T1**, and the Tangible aspect **T2.**

$$f_{(T1+T2)} = f\{[X+Y+Z]+[L+U+R]\}$$

This is shown at the **top** of ***Link Diagram -1***.

03. THE OFF-SPRINGS

A social group **G** is made up of individuals. The group development and its productive contribution, is the cumulative outcome of each individual development **I**, or

$$G = \sum I.$$

The individual development is a combination of their economic satisfaction **E** and their social comfortability **S**, among each individual members, or

$$I = \sum (E + S).$$

A set of strong and satisfied social groups with a development value **G**, within each nation contributes to the prosperity and the Socio-Economic development of the nation **D**, or

$$D = \sum G.$$

Co-existence, peace and prosperity **P** among the developing world is the cumulative effect of the socio-economic smoothness between the nations **N** or

$$P = \sum N$$

Hence, **P** the Prosperity as a direct function of **G**, the Groups in a nation, could be related as

$$P = \sum N = \{1 \text{ to } n\} \sum \{1 \text{ to } g\} \sum G$$

where **n** is the number of nations and **g** is the number of groups.

The smallest unit in this mathematical relationship is the social group **G**, and it is easy to strengthen their productive efforts through appropriate **Social infrastructure**. The bigger unit is the nation **N**, and it is easy to smoothen their differences through the development of implementable **techno-commercial** set-up.

This is shown at the **bottom** of ***Link Diagram -1***, along with their upward relationship towards infrastructure mix components.

04. EFFECTS OF INFRASTRUCTURES

An optimum intangible infrastructure contributes effectively towards the social comfortability of the individual through the following :-

- Surplus wealth among households leading to adequate **domestic savings**. The quantum of saving contributes to the social comfortability in tow-fold ways, namely through long-range domestic security, and contribution to the indigenous wealth formation.

- Improvement in the quality of **human potential** to contribute more effectively to all the domestic sectors through innovation, research, development and physical work. This results in productive and moral commitments from individuals to the nation.

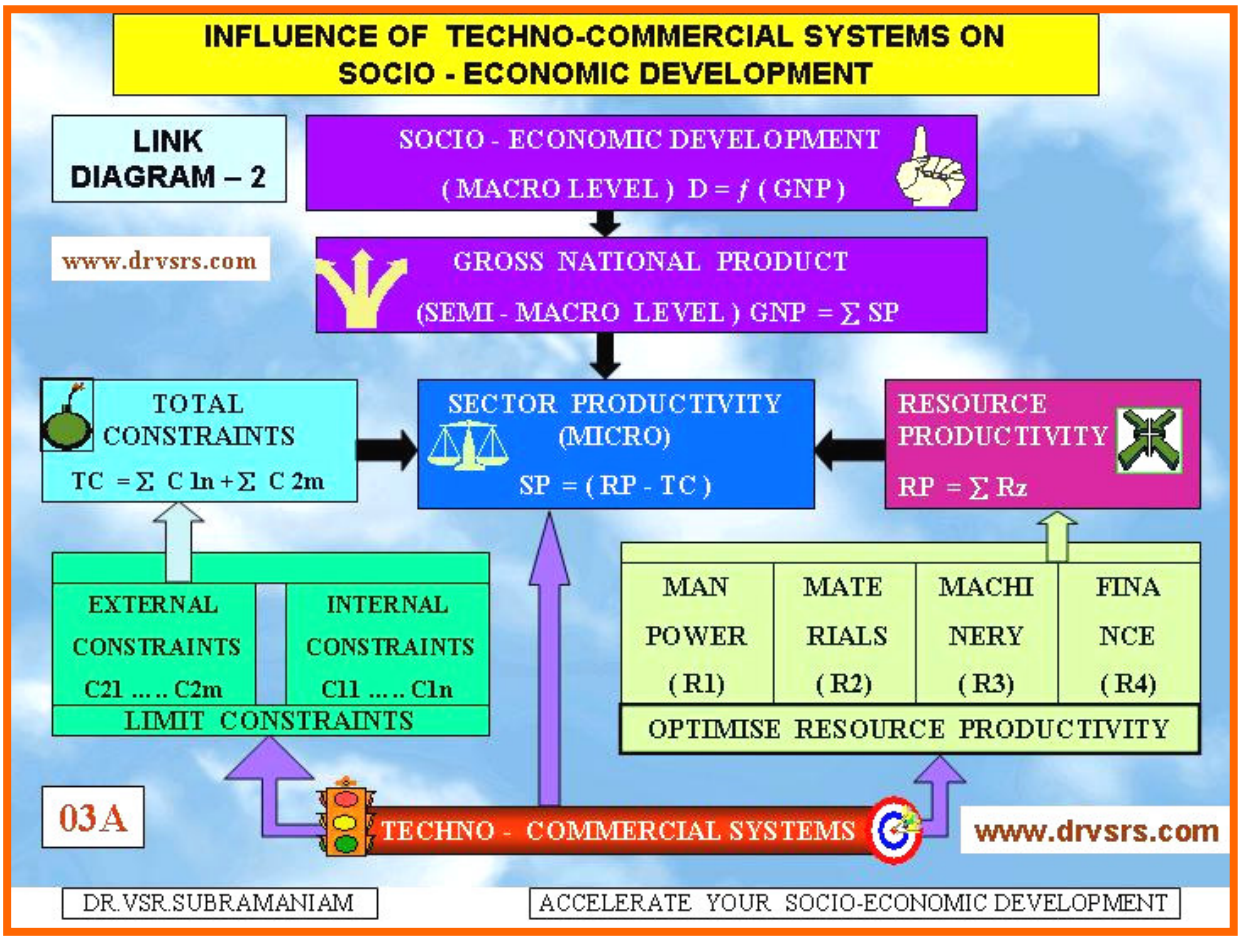
Similarly an optimum tangible infrastructure could strengthen the domestic resources through economic satisfaction among the local population through : -

Adequate **domestic investments** from the realised domestic savings, through the intangible infrastructure. This introduces the dimension of indigenous productive investments.

- Domestic investments leading to **domestic technology** suited to each nation depending upon their geographic, cultural and the living habits of the national house-holds.

Thus the first and the prime need for a broad-based socio-economic development is to strengthen the national **socio-economic infrastructure**.

05. TECHNO-COMMERCIAL SYSTEMS



LINK DIAGRAM - 2

Approaching the socio-economic development **D** from a pure productive angle, it could be considered as the apex achievement of every nation in a macro level. It is a function of the Gross National Product **GNP**, which represents the aggregate income generation, or

$$D = f(GNP)$$

The GNP in turn, is the cumulative wealth generation from various sector productivity **SP**, contributing towards the total productive efforts of the nation, or

$$GNP = \sum SP$$

The Sector Productivity **SP**, in a semi-micro level is the net effect of the following :

- Each Resource productivity **RP** which is the cumulative productivity results of the four principal resources, namely the Manpower **R1**, Materials **R2**, Machineries **R3**, and the Finance **R4**. Here, the technology, which optimises the utilisation of all resources, is considered as a techno-investment. Or

$$\mathbf{RP = R1 + R2 + R3 + R4 = \sum Rz}$$ where **z** is from 1 to 4.

- Total constraints **TC**, is a cumulative effect of the **Internal constraints C11** to **C1n** and **External constraints C21** to **C2m**, where **n** is the number of Internal constraints (1 to n) and **m** is the number of External constraints (1 to m) in a nation. Or

$$\mathbf{TC = \sum C1n + \sum C2m}$$

- The balanced net sector productivity is hence given by

$$\mathbf{SP = (RP - TC)}$$

The common management medium to optimise the sector productivity in a **micro-level**, is by tuning the **Techno-Commercial systems**, through the following methodologies :-

1. Prediction and minimisation of the effects of the external and internal constraints.
2. Direct optimisation of sector productivity through appropriate production and commercial technology mix, and their periodic update.
3. Plan, pool, monitor, control, appraise and balance the resource utility through modern management methods.
4. Optimise each resources productivity, with upgraded quality, and minimise cost and wastage components through Operations Research techniques.
5. Maintain the continued productive efforts by moderating the demand through a feed-back system, from the users to the producers.

The influence of techno-commercial systems on socio-economic development through sector productivity and **GNP** is shown in ***Link Diagram - 2***.

The expected Management Controls on the Sector Productivity are,

- The development and update of **technological status**.
- Feasibility and justification of **domestic investments** for indigenous production of goods and services.

The expected Management Controls through the techno-commercial systems are,

- Cost reduction and quality optimisation, leading to more corporate surplus for **domestic investments.**
- Technology and resources optimisation techniques leading to the synchronised development of more inventive, innovative and productive **human potential**..

Having identified the basic ingredients to develop the intangible social infrastructure and the tangible techno-commercial status, it should be now possible to derive a methodology towards an implementable approach.

06. APPROACH TO OPTIMISATION

The above logical steps lead towards a sequence that the social infrastructure could motivate the population towards domestic savings, and that could be utilised for domestic investments. These investments could be productively utilised by appropriate and advanced techno-commercial systems, optimally manned and managed by domestic human potential.

But these logical steps are of vicious in dimension, as these involve tangible technical aspects; and intangible social infrastructure development and human skill tuning.

Hence, it is necessary to develop a Mathematical model, Simulate the ingredients, Solve their interactive contributions, and Interpret the results into implementable decisions. This is described in **Part - 2.**

ABBREVIATIONS		
C = Current needs	D = Socio-Economic Development	E = Economic Satisfaction.
F = Future Needs	G = Social Groups	GNP = Gross National Product
I = Individual Development	L = Quantum Needs - Consumption Limit	
N = Number of Nations	P = Prosperity	R = Productive Work Environment
T1 = Intangible (Unquantifiable) Infrastructure	T2 = Tangible (Quantifiable) Infrastructure	
R1 = Manpower Resource	R2 = Machinery Resources	R3 = Material Resources
R4 = Financial Resources	RP = Resource Productivity	
S = Social Comfortability	SP = Sector Productivity	
U = Avoidance of Un-social / Excess Consumption	X = Appeal to the Senses	
Y = Maintenance of Self Balance	Z = Proper Inter-action	
a = Feeling of Satisfaction	c = Peace to reduce Psychological Tensions	b = Ensured availability of essential needs (Food, Shelter and Clothing)

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ACCELERATE YOUR SOCIO-ECONOMIC DEVELOPMENT
AN ECCENTRIC BI-CIRCULAR MODEL & SOLUTION

PART – 2 : MODEL DESIGN AND SOLUTION

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DR.VSR.SUBRAMANIAM

EXECUTIVE SUMMARY

Backed by my assignments with international Socio-Economic development institutions, and accredited scholarly associations, I developed a thirst to design a practical model to accelerate the pace of development of the third world nations.

Part-1 provided a " lead" towards creating the pre-conditions to solve the constraints envisaged by the Noble Laureate (1979) Professor Arthur Lewis (1915-1991. St.Lucia/UK. Princeton University, Newjersey, USA) in his Noble prize paper in Economic Science, towards the possible de-link of the growth of developing countries from that of the developed world. The strategic preconditions identified were the infrastructures, made up of intangible "Social Comfortability" and tangible "Economic Satisfaction". Smoothing the inter-country difference is possible through a "Techno-commercial" normalisation, to optimise the resource utilisation, limiting the constraints, and balancing the Sector Productivity in a Micro level. These fine tuning is expected to promote "domestic savings" through group motivation and cost reduction, and pave way for "domestic investment" leading towards productive environments and strengthening of the "domestic technology".

These in turn promote local innovations, research and development and domestic skill optimisation. But the implementation of these steps assumes a vicious dimension. Hence a mathematical modeling, simulation of the situations and solution interpretation should be followed.

In this part-2, the model is developed in the form of two intersecting circles, one linking the domestic savings with the domestic investments, and the other linking the domestic human potential with the domestic technology. The former representing the external entrepreneurial activity is designated as "Exogenous", and the latter involving internal productive activity is designated as "Endogenous". A geometric approach is used to solve these two intersecting circles, aiming towards the central objectives, namely, integrating the Exogenous and Endogenous aspects, upgrading the socio-economic status, and enlarging the qualitative and quantitative outputs.

The inference derived from the geometric solution indicate that, the attempts to accelerate the pace of socio-economic development should be to encourage equal efforts in both the domestic investments through domestic savings, and - utilisation of domestic skills for the domestic technology, updating towards the latest world developments. This will synchronise the Endogenous and Exogenous aspects of Socio- socio-economic development, at any given level. Any attempt to upgrade the existing Endogenous aspect only or Exogenous aspect only, is bound to create an unfavourable disturbance in this synchronisation, and it should be immediately re-synchronised. The qualitative and quantitative dimensions of the economy could be improved by expanding the operating dimensions in the Endogenous and Exogenous aspects, in equal magnitude.

The past and current experiences of the developing and the developed world support this model solution.

This model development and solution process has attempted to provide enough "reasoning", to the philosophy and methodology to accelerate the rate of Socio-economic development, in line with the remarks by the Greek mathematical philosopher Pythagoras, whose geometric concepts are used in this paper. Also this is a pioneer attempt to use the Geometrical methodology, which according to the English philosopher Thomas Hobbs, is the only science to please the Gods to bestow the best on mankind, which could be nothing other than an accelerated Socio-economic development. Since the total approach is based on strong foundations and practical experience guidelines, it should be applicable to the development criteria for all the nations in the world, and establish an ever-lasting Peace and Prosperity in the new Millennium.

07. THE DESIGN LEAD

Part-1 of this paper developed adequate background and provided a "lead" towards a design to socio-economic development optimisation model, through a mathematical approach.

This approach in a summary, started with the question raised by the Noble Laureate in Economic Science (1979), Sir Arthur.W.Lewis (1915-1991. St.Lucia/UK. Princeton University, Newjersey, USA) on the existence of an inevitable linkage of the developing world growth rate, to that of the developed ones, the possible solutions and their constraints.

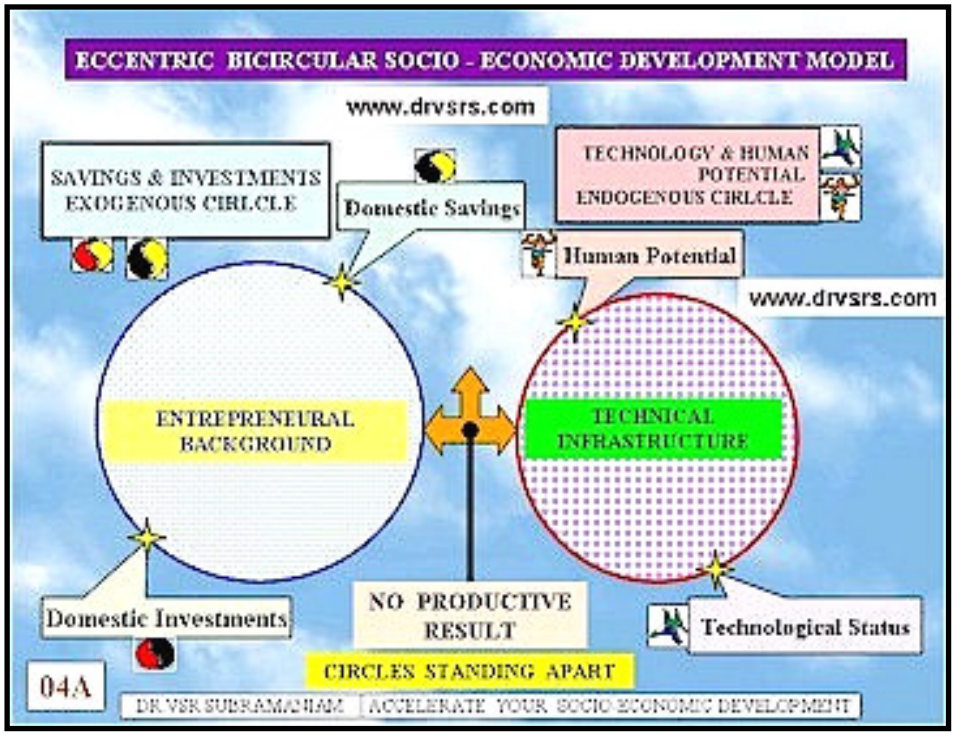
In order to create a pre-condition to overcome the problems existing within the developing countries, the strategic approach should be to strengthen the inter-group relationship within a nation through **social infrastructure development**, to utilise their productive capacity, and smoothen the inter-country differences through **techno-commercial upgrade**.

Social infrastructure development is a function of intangible **social comfortability** and the tangible **economic satisfaction**. Techno-commercial systems approach upgrades the technology, reduces the influence of constraints, and optimises the resource utilisation. Both these result in the development of four basic ingredients namely, the **domestic savings** through group motivation and cost reduction; the **domestic investments** through productive orientation, the **domestic technology** through local innovation, research / development; and **domestic skills** through improved productivity, modern management methods, and operations research techniques.

But, the implementation of these logical steps assume a vicious dimension. Hence, it is necessary to simulate a mathematical model, solve, and interpret the results into implementable decisions.

08. THE BI-CIRCULAR MODEL.

In line with the lead provided in Part-1, and the recommended approach by the Noble Laureate Sir. Arthur Lewis (1915-1991. St.Lucia/UK. Princeton University, Newjersey, USA. Nobel Laureate of 1979), an econometric discussion is used in this part, to select an appropriate model. According to the Nobel Laureate, "If a sufficient number of developing countries reach self sustaining growth, then we are in a new world. It will be the growth of the developing country production that determines the developing country trade, and internal forces that will determine the rate of growth of production".



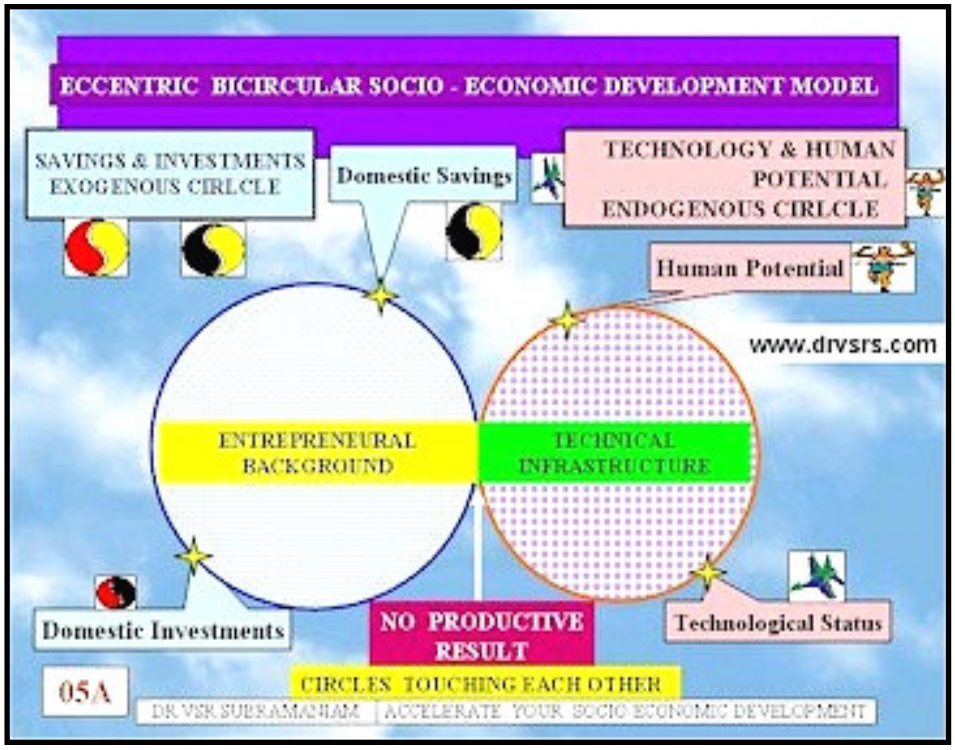
DEVELOPMENT CIRCLES APART

In line with these thoughts, the intangible domestic infrastructure should be the support for domestic investments by the domestic savings. The tangible infrastructure is to develop domestic technology and synchronise the domestic skills for its optimum utilisation. These are represented by four points on space, and a circle is drawn to link domestic savings to domestic investments, and another circle is drawn to link the domestic technology with domestic skills.

The domestic technology and human potential development are intangible know-how development within a nation, and the circle connecting these are designated as **Endogenous** in line with their internal orientation.

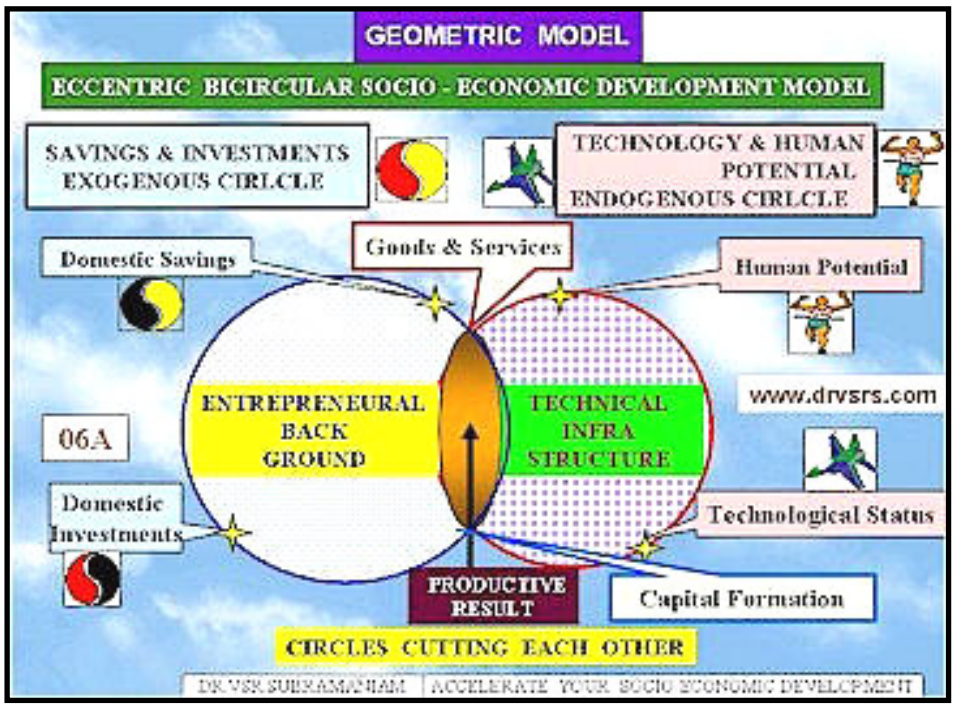
The domestic savings and domestic investments are tangible wealth development through surplus potential creation in a nation, and the circle connecting these are designated as **Exogenous**, in line with their external surplus generation orientation.

If the Exogenous and Endogenous circles stand apart, then the financial aspects of the former could not meet the know-how potential of the latter, and there could not be any productive results.



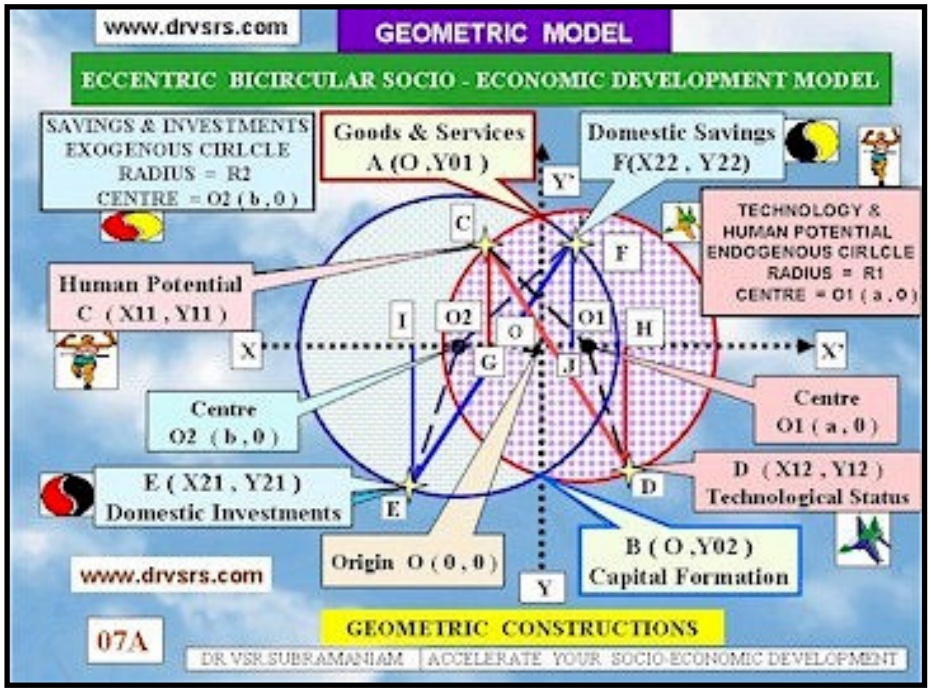
DEVELOPMENT CIRCLES TOUCHING EACH OTHER

Even if they come closer and touch each other, then also there could not be interaction between the two circles, towards any productive result from the Endogenous and Exogenous aspects of the economy.



DEVELOPMENT CIRCLES CUTTING

Hence, for any development orientation in a nation, it is assumed that the two circles should cut each other to result in two distinct points of intersection. One point of tangible inter-section is the **Capital formation**, representing an offspring of the domestic savings approaching to meet the needs of domestic investments. The other point of intangible inter-section is the **Goods and Services output**, as a result of the utilisation of the national technology by the domestic human potential.



GEOMETRIC CONSTRUCTION ON CUTTING DEVELOPMENT CIRCLES

Selecting the line connecting the centres of Exogenous and Endogenous circles as X axis, and the line connecting their points of intersections as Y axis, to form and origin **O** (**0,0**), this graphic representation develops an **Eccentric Bi-circular Socio-Economic Development Model**, as shown in the Geometric Model Diagram. It is assumed that the radius of the Endogenous circle is **R1**, with its centre at **O1**(**a**,**0**), and the radius of the Exogenous circle is **R2** with its centre at centre at **O2**(**b**,**0**). The co-ordinates of the various points on the two circles with reference to the origin **O** (**0,0**) are :-

- **Goods, Service outputs - A (0,Y01). Points of intersection.**
- **Capital formation - B (0,Y02).**

- **Human potential - C (X11,Y11). Endogenous**
- **Technological status - D (X12,Y12).**

- **Domestic investments - E (X21,Y21). Exogenous**
- **Domestic savings - F (X22,Y22).**

The area of the arc in the right side of the Y - Axis represents the quantum of **Entrepreneurial background support** provided by the Exogenous circle. The area of the arc in the left side of the Y - Axis represents the equivalent **Technical Infrastructure generation** by the Endogenous circle.

Using this model, a geometric solution is attempted to optimise the Socio-Economic Development.

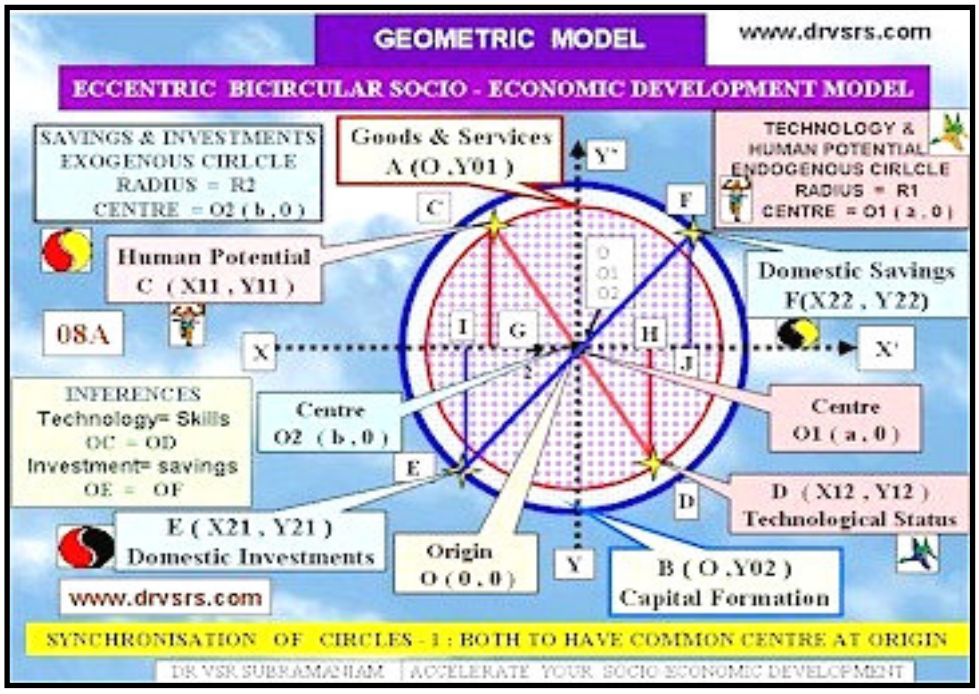
09. DEVELOPMENT OPTIMISATION

The mathematical optimisation is carried out in a three dimensional process through

A) Perfect synchronisation of Endogenous and Endogenous circles.
B) Development upgrade from lower to higher levels.
C) Dimensional development through qualitative and quantitative improvement.
A **geometric** approach is used in the solution process.

09A. SYNCHRONISATION OF CIRCLES

The synchronisation of Endogenous and Exogenous circle is an attempt to integrate and normalise the technical infrastructure represented by the former, with the entrepreneurial background provided by the latter.
In order to aid this solution, the lines **CG**, **DH** in the Endogenous Circle, and **EI**, **FJ** in the Exogenous Circle, are drawn parallel to the Y axis, meeting the X axis at **G, H, I** and **J** respectively. The complete geometric solution is presented in Geometric Model Solution. The interpretation of the solutions are : -



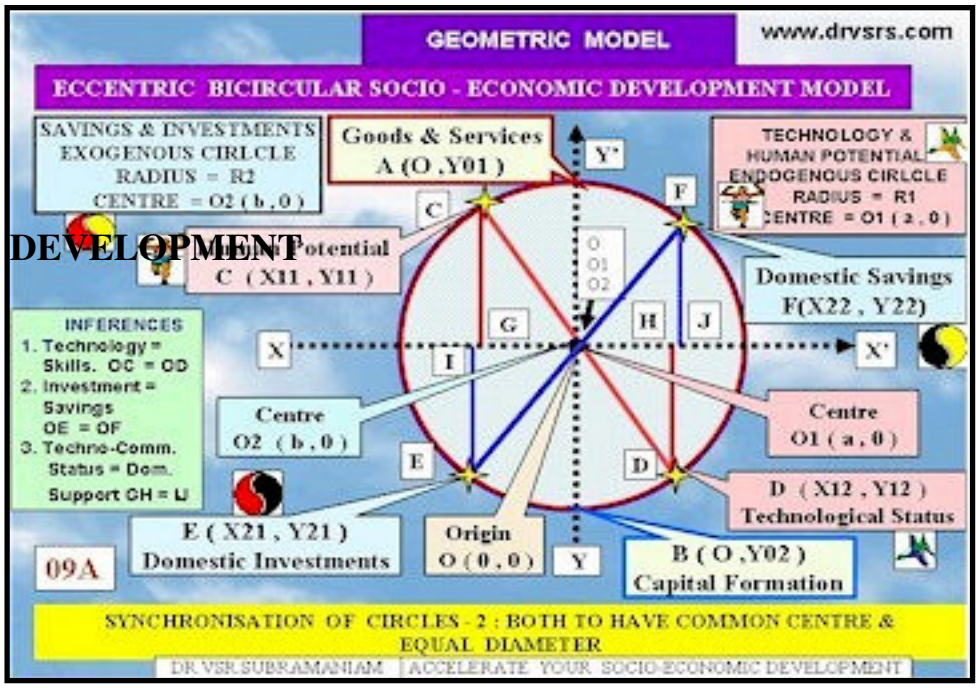
DEVELOPMENT CIRCLES WITH COMMON ORIGIN

1. **Both circles to have common centre at the origin, to represent a common and central objective to synchronise the Endogenous and Exogenous aspects. There are two solutions for this condition.**

   A) For a given socio-economic development status, the solution **OC = OD** could be interpreted as the degree of development in indigenous technology should be supported by an equal development in the domestic human skill. This enforces a need for a balance between technology and skill at any point of time. It also implies that, even if started with imported technology, it should be moderated to suit local environments, and local human skills should be trained to utilise them optimally.

B) For a given socio-economic development plan, the solution **OE = OF** could be interpreted as, any increase in domestic investment at a point of time should be attempted through domestic savings. This condition deterrents a nation to be foreign dependent for its socio-economic development, after a reasonable period, even if it is necessary to start with.

This also warrants the efforts of domestic corporate units and house-holds to mange their income and expense properly to generate surplus for re-investment.



DEVELOPMENT

CIRCLES WITH COMMON ORIGIN + EQUAL RADII

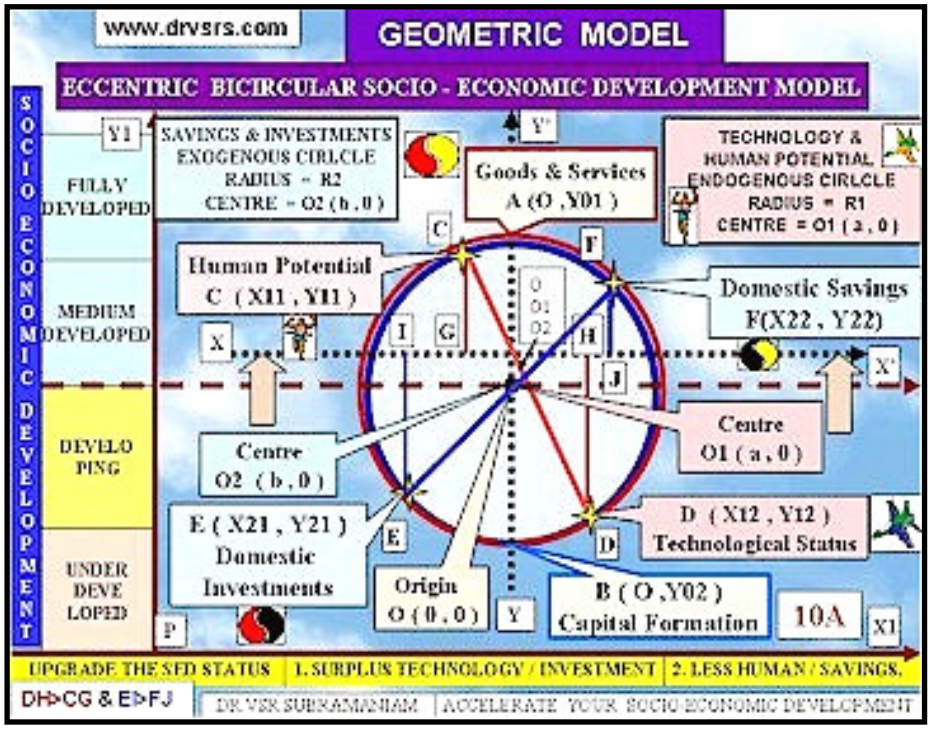
2. Both circles should have equal radii with centres on the origin, to represent an integrated approach to the Endogenous and Exogenous aspects, under a common objective and central guidelines.

The solution **GH = IJ** could be interpreted as, the sum component of the techno-commercial development and its practice in a nation, should be equally supported by the sum component of domestic investments and its generation.

It implies that any plan for the generation and the utilisation of domestic capital should be towards adoption of improved technology and well-trained indigenous skills.

09B. DEVELOPMENT UPGRADE

Once the Endogenous and Exogenous circles are synchronised within a nation, then the next attempt should be to upgrade the degree of socio-economic development. To initiate this dimension, an external Y-axis **PY1** representing the Socio-Economic Development status is drawn on the left side of the circles, parallel to the axis **YY'**. (See **Geometric Model**).



DEVELOPMENT UPGRADE (PUSH UP)

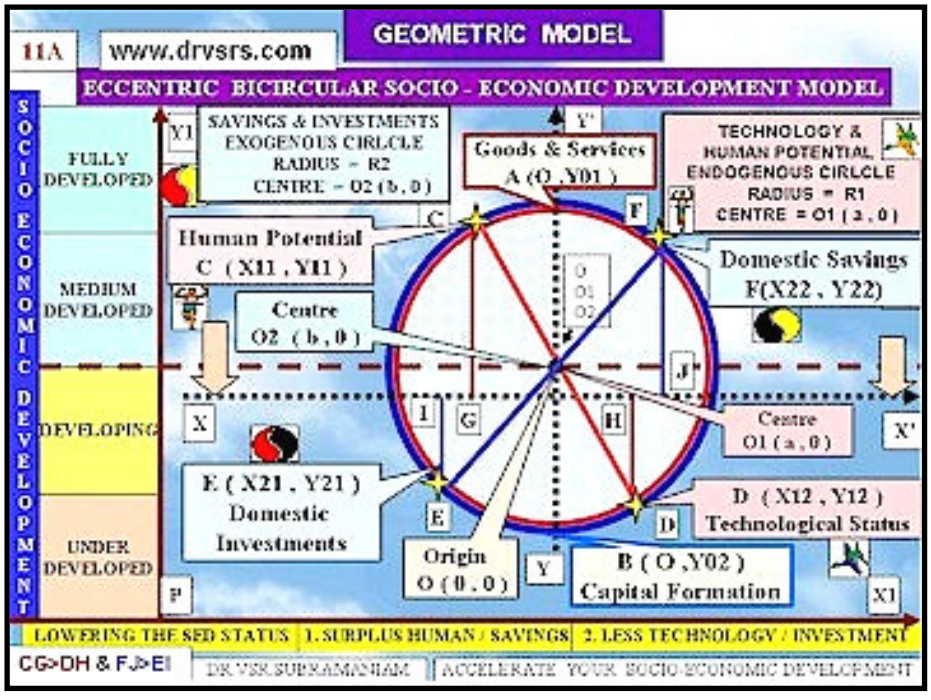
The locus of the origin **O (0,0)** along the X Axis, upward or downward with reference to **PY1** represents the development status of any nation on a relative scale. Movement of X axis with reference to **PY1** will proportionately disturb the synchronisation pattern of Endogenous and Exogenous circles.

A movement of the X - Axis <u>upward</u>, or attempts to <u>improve</u> the Socio-economic development status, is expected to result in the following.

a) Increase in the distances **DH** and **EI**, representing a need for simultaneous and equal upgrade in both the domestic technological status and domestic investments, respectively.

b) Decrease in the distances **CG** and **FJ**, indicating the occurrence of a gap in the domestic human skills and a reduction in domestic savings respectively.

Hence, a planned strategy should be followed to create the necessary pre-conditions to synchronise the Endogenous and Exogenous disturbances as per (a) and (b), before attempting to upgrade the socio-economic development status of any nation, from any given existing level. This could be interpreted as development needs simultaneous upgrade in **GNP** through increased investments and improved technology, along with a strategic approach to solve the gaps in domestic savings and skills, to realise the productive returns from the investments.



LOWERING THE DEVELOPMENT
(PUSH DOWN)

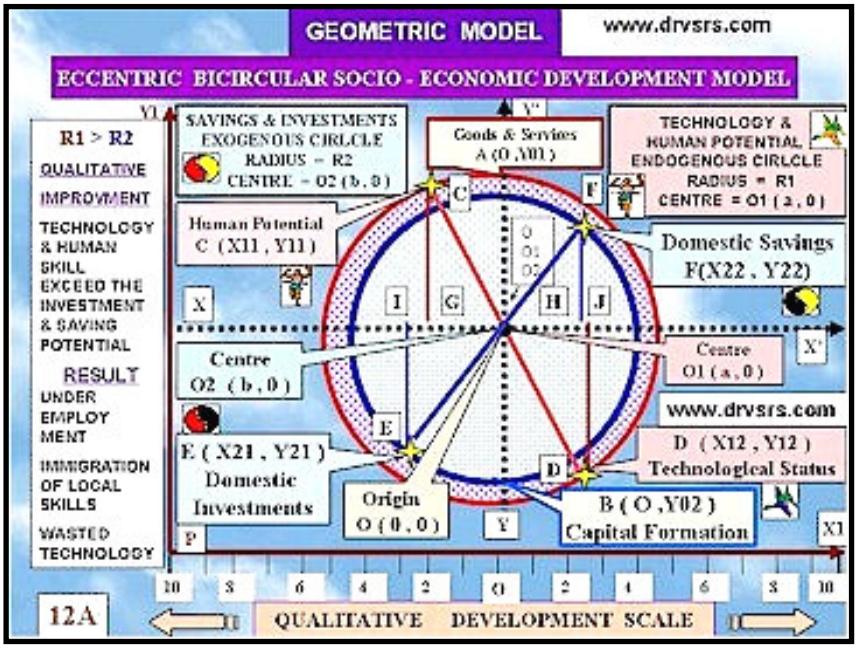
2. On the other hand, a movement of the X - Axis <u>downward</u>, or <u>lowering</u> the status of socio-economic development, is expected to introduce the following effects : -

c) Increasing the distance **CG** and **FJ** indicating the availability of surplus human skills and increase in domestic savings, respectively.
d) Decreasing the distances **DH** and **EI** representing a reduction in the need for advanced domestic technology and an environment for decreased investment potential, respectively.

These conditions are substantiated by the fact that, a decrease in the socio-economic development status leads to a reduction in the consumption of commodities and services, and lowering the purchasing power of the local currency. These lead to a corresponding reduction in the productive activity in the economy, and result in surplus labour and under or un-utilisation of technology. As a consequence of these, needed goods / services will become scarce, reducing the opportunities for spending and investments. This is a situation in which the domestic savings will exceed the domestic investments.

<u>09C. DIMENSIONAL IMPROVEMENT</u>

Besides a vertical socio-economic development shift, it should also be possible for a nation to moderate the qualitative and quantitative aspects of the economy along an external X axis **PX1**, drawn parallel to the axis XX' (See **Geometric Model**).



QUALITATIVE IMPROVEMENT IN DEVELOPMENT

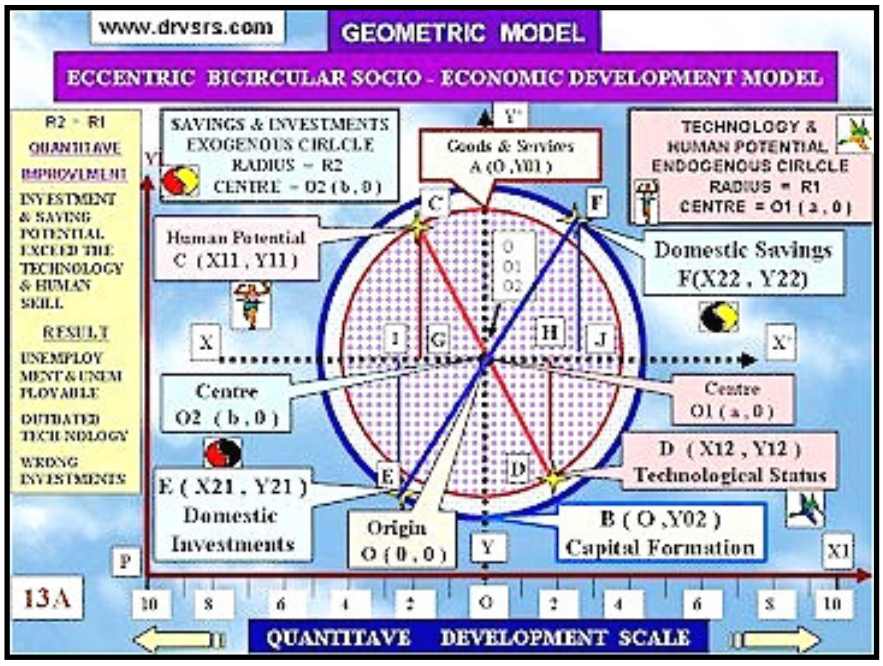
The dimensional improvement is measured on a 10 point scale, marked on either side, with zero aligned to the origin **O** of the Endogenous and Exogenous circles

1. The <u>qualitative</u> <u>improvement</u> is exhibited by <u>increasing</u> the diameter R1 of the Endogenous circle with reference to the axis PX1, and the inferences are as follows : -

a) The degree of synchronisation of techno-commercial systems and domestic human potential is given by the diameter of the circle and hence by the distance **CD**, which is **OC + OD**, when it passes through the centre of the circle **O1**.
b) Qualitative disbursement of the utilisable human skill is given by the distance **OG**.
c) Qualitative capability of the domestic technology is given by the distance **OH.**

When the qualitative aspect is optimum through the synchronisation of the circles, then , **OC = OD** and **OG = OH.**

It implies that the qualitative potentials of both the domestic skills and domestic technology should be simultaneously synchronised, when the diameter **CD** of the Endogenous circle is increased. Hence, any upgrade in technology, should be equally linked to the human potential infrastructure development.



QUANTITATIVE IMPROVEMENT IN DEVELOPMENT

2. **The <u>quantitative improvement</u> dimension is represented by <u>increasing</u> the diameter R2 of he Exogenous circle with reference to the axis PX1, the inferences are as follows.**

d) The degree of synchronisation of domestic investment with domestic savings is given by the diameter of the circle, and hence by the distance **EF**, when it passes through the centre of the circle **O2**.
e) Quantitative disbursement pattern of domestic investment is given by the distance **OI**.
f) Quantitative generation potential of domestic savings is given by the distance **OH**

When the quantitative aspect is optimum through synchronisation of the circles, then **OE = OF** and **OI = OH.**

It implies that the quantitative potential of both the domestic investments and savings should be synchronised to the diameter **EF** of the Exogenous circle, when the diameter **R2** is increased. Hence, any increase in domestic investments, should be planned and linked to the quantitative availability from the domestic resources.

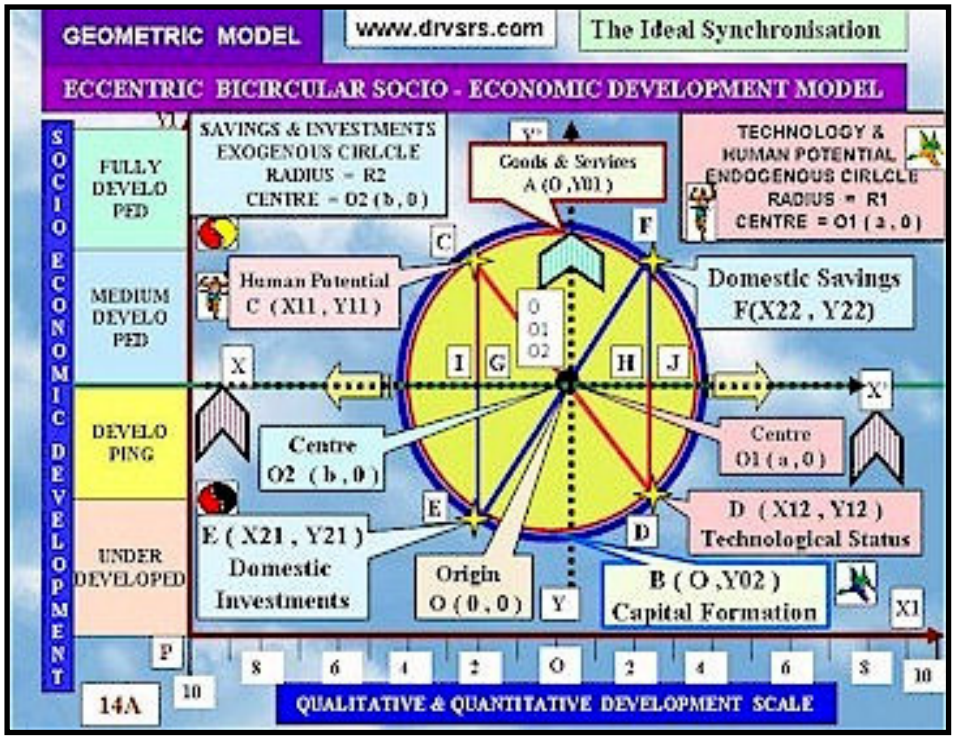
The qualitative and quantitative capability of any status of socio-economic development could be improved by increasing the diameters of Endogenous and Exogenous circles respectively. But the attempts for such increase will disturb the synchronisation of the circles as described above. Proper co-ordination between the improvement and synchronisation could lead the development towards more successful and rewarding end-results.

<u>10. MODEL DIRECTIVES</u>.

To reach a status that the internal forces among lesser developed nations will determine their own rate of growth, Sir Arthur Lewis (1915-1991. St.Lucia/UK. Princeton University, Newjersey, USA. Nobel Laureate of 1979) in his Nobel prize paper said that "For those who talk the language of centre and periphery, this means that, a number of countries leave the periphery and join the centre. Or, if they are specially linked to each other by preferential trade and currency arrangement, one may even speak of creation of a new centre, consisting of former peripheral nations that have built a new engine of growth together".

The eccentric bi-circular model developed and solved in this paper, is an approach to move the centre of the socio-economic development of nations upward, with the synchronisation of its peripheral components, on the qualitative and quantitative axes of the wheels of engines of growth.

Either internally or with foreign assistance to start with, every nation should attempt within a possibly minimum period, towards domestic investment supported by domestic savings. This is an Exogenous factor. The methodology to generate such internal surplus is the development of indigenous technology to suit the domestic environments, its productive utilisation and updating through domestic skills. This is an Endogenous factor. There should be equal efforts towards internal investments as well as the technology utilisation, as productive results are possible only when they intersect and co-ordinate together. The Endogenous and Exogenous environment synchronisation could lead a nation towards optimum socio-economic development orientation.



IDEAL SYNCHRONISATION OF DEVELOPMENT CIRCLES

The synchronised national environment should be upgraded to lift the economy towards medium and full development form under and developing status. This shift will disturb the achieved synchronisation between the Endogenous and Exogenous aspects of the economy. Then the immediate attempt should be made to re-stabilise the degree of synchronisation, and renew the efforts for upgrade.

In a parallel process, the qualitative and quantitative aspects of the economy should be improved by expanding the operating diameters of the Endogenous and Exogenous environments respectively. It implies that investments through indigenous sources should be expanded in equal dimension with technological advancement, utilising the domestic skills.

The socio-economic superiority of the developed nations are due to the application of the directives generated by this geometric model. Non-attempt towards these directives explain the socio-economic stagnation, deterioration, and increased dependence of under developed and developing nations on assistances from the developed world.

The ideal situation in a **Concentric Solution** shown below the **Geometric Model**.

11. MODEL AND THE WORLD

The applicability of this Model directives could be evaluated from the situations in both in the Under-developed / Developing and the Developed nations.

11A. UNDER-DEVELOPED / DEVELOPING NATIONS

- Many nations believe that their technological standards should be rapidly up-graded by borrowed funds from the developed nations or institutions. A good example is in the area of Computerisation and Atomic Power Plants, without adequate domestic human skills as well as infrastructure to support their continued productive utility. As a result, the funding nations / institutions incorporate a condition that all the equipments should be bought from them, and their Experts should be employed (at their rate of pay, which imposes unbearable overheads on the borrowing nation) to implement these techno-commercial upgrades. This is against this Model directive that, even though one starts with a reasonable foreign investment, progressively the investment generation should be localised, as well as the local skills should be tuned to man the same. As a result, there are three implications on the under-developed & developing nations.

1. They do not get the benefit of this modernisation, as the local population is not moderated to continue and get the productive values of these investments.
2. They face problems of the waste-disposal, pollution, environment degradation, shortage of maintenance-know-how and unavailability of spares.
3. The fund provided by the source nation or set-up is already re-absorbed by them through the sale of equipments and consultancy charges. Inspite of these, the poor nation is a debtor to the funded source, for the total funded amount.

- In all under-developed and developing nations, it is a common scene to have a policy to develop their human skills rapidly through institutional advancement, leading to high investment in the Institute of Technologies / Management, without adequate development in domestic technology to absorb the skills emerging out of these institutions. This results in the immigration of these trained / skilled professionals towards the developed nations. This supports the violation of this Model relationship between the Technology and Human development. The result is that, the developed nations benefit and absorb the under-developed / developing human-skills, upgraded at the cost of the poor nations.
- Some leading nations possess Atomic Bombs and Satellite Technology, leaving a majority of their population to suffer below the Poverty line. This confirms the violation of this Model directives to synchronise the domestic technological developments in line with the available human skills, to provide their prime needs (food, clothing and shelter) at first , and moderate the upgrade in steps. Also these non-productive / hi-tech investments are from borrowed capital, and as a result, the country has only expanded their international debts.
- These nations, having become a debtor to the developed nations and the international funding institutions, because of the violation of this Model directive, target to clear their balance of payments by accelerated export. This results in exporting basic needs (food, shelter and clothing), and scarce raw materials, to the developed nations. This deprives legitimate requirements of the national infrastructure and the domestic population, and the cost of living escalates beyond the reach of the common man.

Even those commodities produced and exported by these nations, through accelerated technological advancement, against this Model directives, are rejected in the international market due to their poor quality and tough international competition from other nations.

- The deteriorating buying-power of the domestic currency, and their low-ranking exchange rate in the international market of these nations, are direct implications of the violation of this Model directives.
- Some nations over-promote unproductive talents (Entertainment, Sports, Beauty / Fashion shows etc...), and develop the local skills in these area, with a vicious publicity and large domestic investments. This is an uni-lateral development of Exogenous component. These do not produce any output services or goods related to the Endogenous aspect, and do not develop productive human potential and the associated domestic technology towards national and international trade. This is not in line with the Model directives. As a result, these unproductive and much publicised personnel get into power, without any socio-economic development background or talents, and destroy the nation.

11B. DEVELOPED NATIONS

- The largest developed nation, believing in the principle of indigenous techno-commercial upgrade by considering the human-potential as a commodity, at the disposal of the State (Centralised Government), scattered into pieces and disintegrated into small nations. Now they have to re-start their social and economic development from scratch. Also similar nations have to break their walls to join with a support nation, in order to re-integrate their socio-economic development in a proper way. This supports the fact that, the technological advancement and human potential are two equally responsible wings of development. These nations are now orienting their policies towards this Model directives.
- Some developed nations, which followed the principles of this Model, developed their local technologies from tested and successful precedence in the world, with their local human potential, innovation and inventions. In a phased manner, they developed a base to bring-in domestic investments from domestic sources. Now they are world leaders to provide the best quality and least cost products, and their currency value in the inter-national market is growing stronger.

- A nation which ruled the whole world, by bringing their investments in foreign lands, utilising the imported skills, and at the same time suppressing the development of the local human skills, have to leave these alien lands, by forfeiting all the techno-commercial infra-structure created by them. This supports the inferences of this Model that domestic source, investment, technology, human potential are the only criteria to survive and progress.
- Developed nations, intuitively knowing the directives of this Model, orient their policies in the following ways.

1. Attract human skills needed by them from under-developed & developing nations, through an open-immigration policy, offer domestic citizenship and naturalise / orient them to merge into their technological infrastructure.
2. Close all visa channels to foreigners, and strictly control the entry, where there is adequate domestic human potential.
3. Modernise, Cross-integrate and link their agricultural and industrial infrastructure, so that the quality is significantly improved, cost is drastically reduced, and the surplus from each sector support the domestic investment needs of the other.

12. CONCLUSION

Pythagoras, the Greek philosopher and mathematician, who lived between 582 and 500 B.C, in his "Diogenes Laertius" said that "The soul of man is divided into three parts, as Intelligence, Reason and Passion. Intelligence and passion are possessed by other animals, but Reason by man alone..... Reason is immortal, all else is mortal." Using his geometric foundations, this paper has attempted to provide enough "reason" for the philosophy and methodology to upgrade the status, and create a self-sufficient existence for the developing world.

Thomas Hobbs, the English philosopher, who lived between 1558 and 1679 A.D said in his "Leviathan" that "Geometry which is the only science that it hath pleased God to bestow on the mankind". This bi-circular model and its geometric solution is expected to please the Godly aspects of socio-economic development, and bestow its immortal-scientific effects on the mankind of the world.

This should be the Model guideline for all nations in the New Millennium 2000.

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DEVELOPMENT ACCELERATION MODEL

SUMMARY OF CONCEPTS DERIVED

- **DOMESTIC INVESTMENTS THROUGH DOMESTIC SAVINGS (INDIVIDUAL / CORPORATE / GOVERNMENT, EVEN THOUGH FOREIGN TO START WITH) (EXOGENOUS CIRCLE)**
- **DOMESTIC HUMAN POTENTIAL TO MAN THE DOMESTIC TECHNOLOGY (LATEST TECHNOLOGY MODERATED TO SUIT LOCAL ENVIRONMENTS) (ENDOGENOUS CIRCLE)**
- **SYNCHRONISE EXOGENOUS AND ENDOGENOUS CIRCLES & OPTIMISE THEIR DIMENSIONS.**
- **Universally Applicable to All Developed / Developing Under-Developed Nations.**

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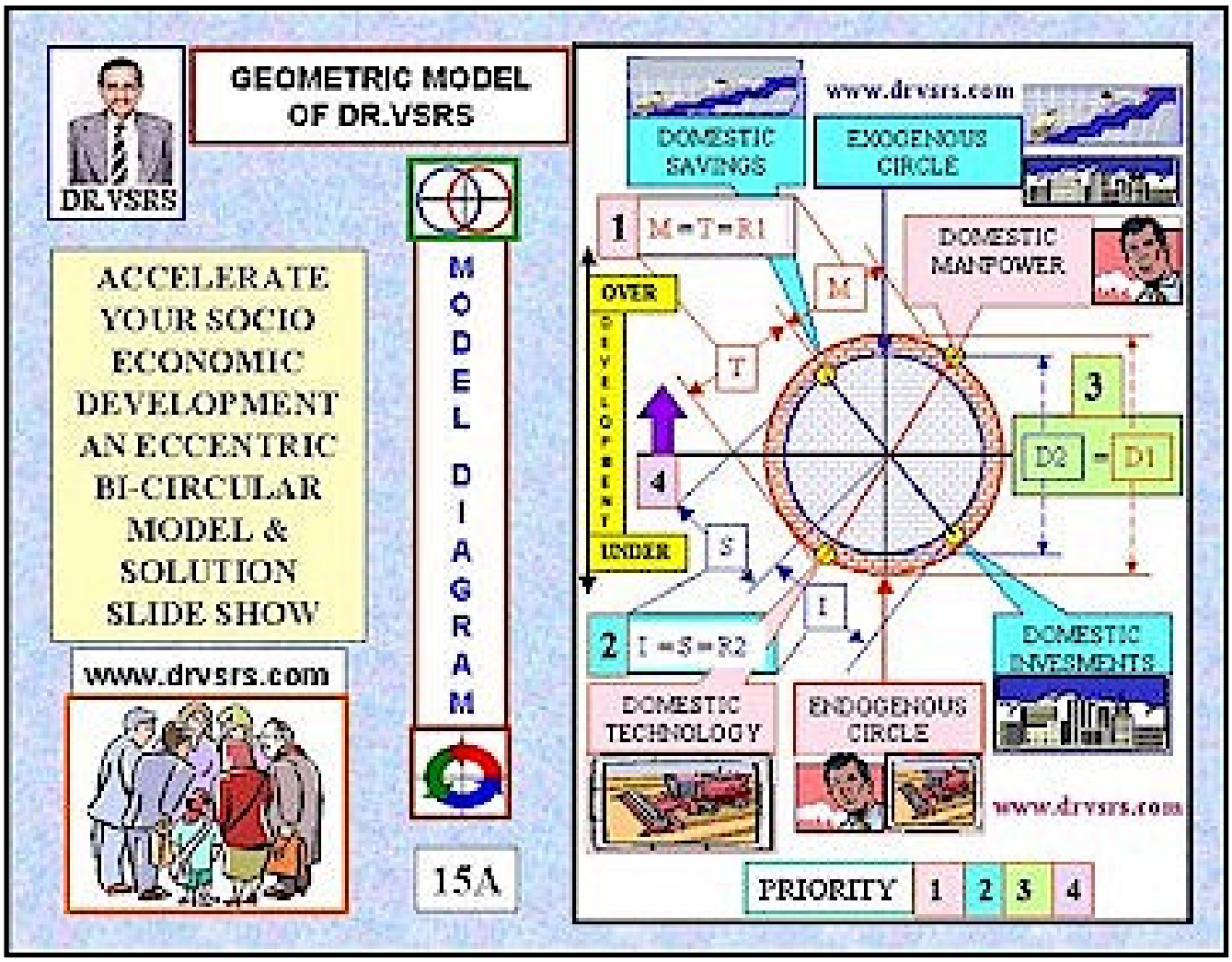
DEVELOPMENT ACCELERATION MODEL INFERENCES SUMMARY SCHEMATIC



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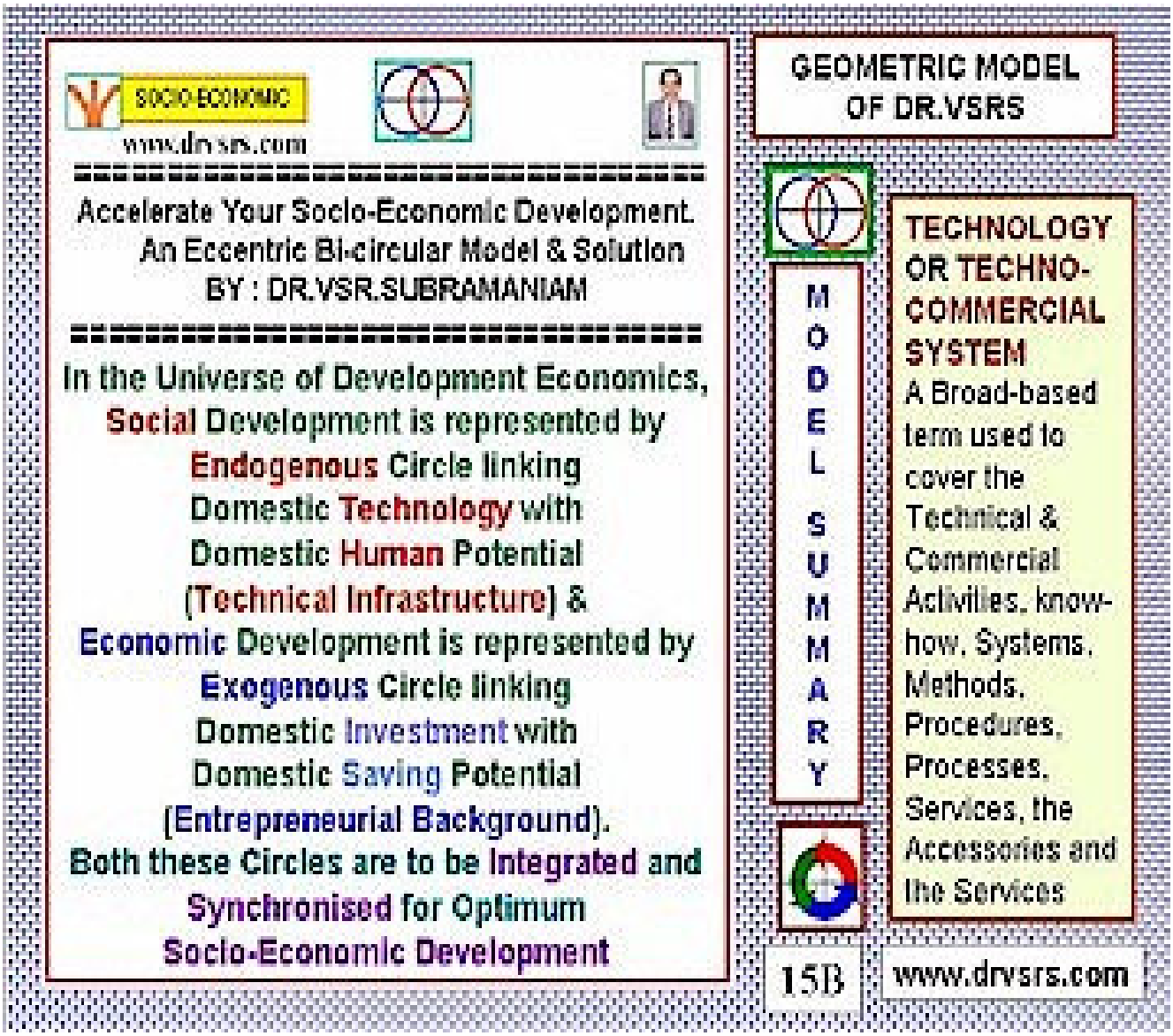
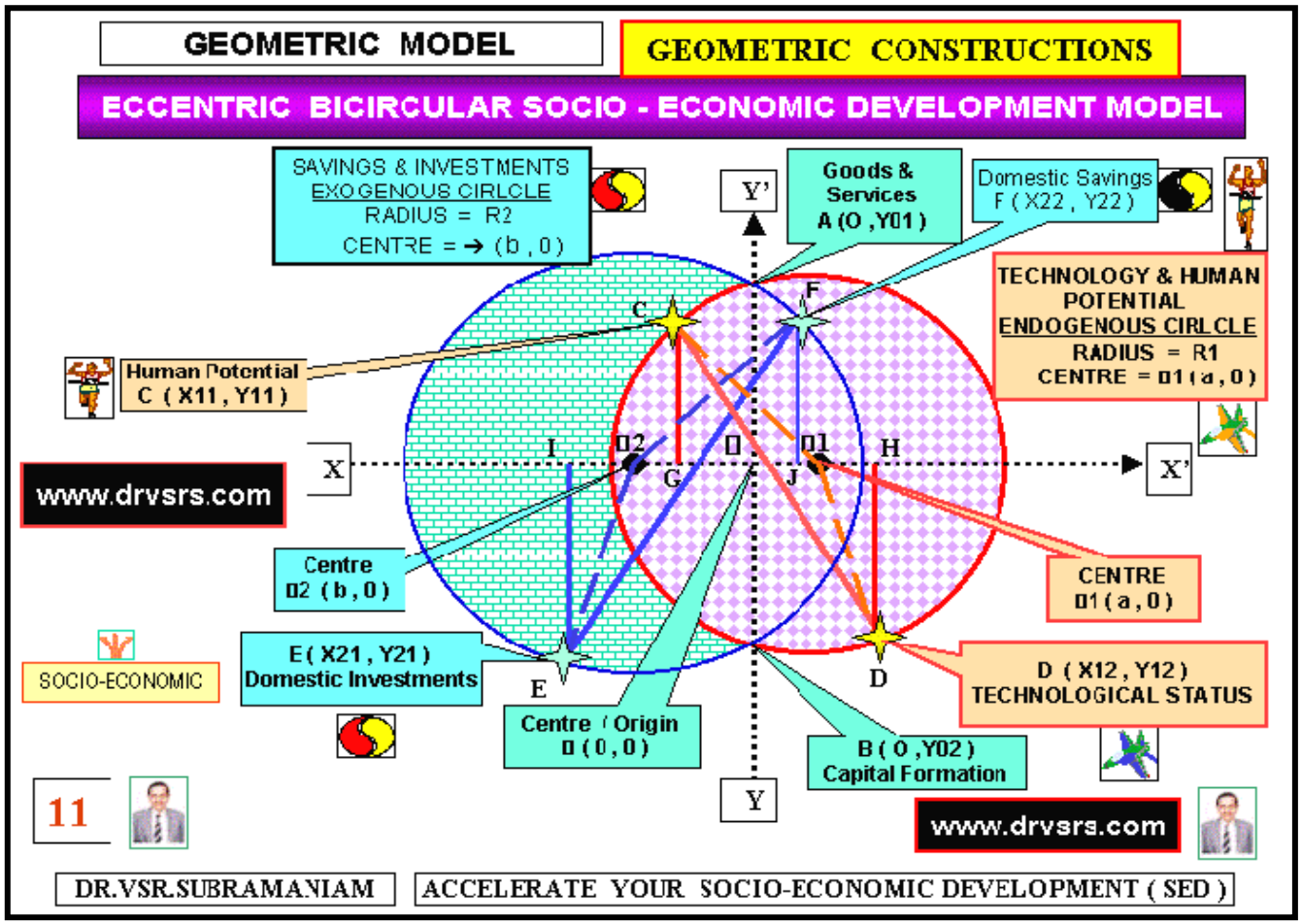
DEVELOPMENT ACCELERATION MODEL INFERENCES
SUMMARY



GEOMETRY OF THE MODEL SOLUTION



A. POSITION.

The X-axis XX' is selected to pass through the centres of the two circles, and the Y-axis YY' through their points of intersection. With reference to these axes, the centre of Exogenous circle **O1** is at **(a,0)**, with radius **R1**. The centre of Endogenous circle **O2** is at **(b,0)**, with radius **R2**. Their points of inter-section are **A (0,Y01)**, and **B (O,Y02)**. The origin is **O (0,0).**

B1. ENDOGENOUS CIRCLE.

{ Note ****2** Means Square }

Points **C (X11,Y11)** and **D (X12,Y12)** are on Endogenous circle, with centre **(a,0)** and radius **R1**. By using the theorem of squares by Pythagoras,

(X11 + **a**) **2 + (Y11) **2 = (R1) **2 Or

(X11) **2 + (**a**) **2 + 2X11**a** + (Y11)** 2 = (R1)** 2 --------(**01**)

(X12 - **a**)** **2** + (Y12)** **2** = (R1)** **2** Or

(X12)** **2** + (**a**)** **2** - 2X12**a** + (Y12)** **2** = (R1)** **2** ----------(**02**)

Subtracting (**02**) from (**01**)

[(X11)** **2** - (X12)** **2**] - 2 **a** (X12 - X11) + [(Y11) **2 - (Y12)** **2**] = 0
or

2 **a** (X12 - X11) = [(X11)** **2** - (X12)** **2**] + [(Y11)** **2** - (Y12)** **2**]
Or

a = [(X11)** **2** - (X12)** **2**] + [(Y11)** **2** - (Y12)** **2**] /
2 (X12 - X11) ---------(**03**)

B2. EXOGENOUS CIRCLE.

{ Note **2 Means Square }

Points **E** (X21,Y21) and **F** (X22,Y22) are on Exogenous circle, with centre (**b,0**) and radius **R2**. By using the theorem of squares by Pythagoras,

(X21 - **b**)** **2** + (X22)** **2** = (R2)** **2** Or

(X21)** **2** + (**b**)** **2** - 2X21**b** + (Y21)** **2** = (R2)** **2** ------------(**04**)

(X22 + **b**)** **2** + (Y22)** **2** = (R2)** **2**

(X22)** **2** + (**b**)** **2** + 2X22 **b** + (Y22)** **2** = (R2)** **2**----------(**05**)

Subtracting (**05**) from (**04**)

[(X21)** **2** - (X22)** **2**] - 2 **b** (X21 - X22) + [(Y21)** **2** - (Y22)** **2**] =
0 Or

2 **b** (X21 - X22) = [(X21)** **2** - (X22)** **2**] + [(Y21)** **2** - (Y22)** **2**]
Or

b = [(X21)** **2** - (X22)** **2**] + [(Y21)** **2** - (Y22)** **2**] / 2 (X21 - X22)
---------- (**06**)

B3. CONSTRUCTION

Draw CG, DH, EI and FJ parallel to Y Axis, meeting X Axis at G, H, I, and J respectively.

Then OG = X11, OH = X12, OI = X21, OJ = X22, CG = Y11, DH = Y12, EI = Y21 and FJ = Y22.

C. CONDITION # 1. ORIGIN TO BE THE COMMON CENTRE FOR BOTH CIRCLES.

{ Note **2 Means Square }

If the Endogenous circle should have origin **O** (0,0) as its centre, then the value **a** should become zero. Hence from (**03**) above,

[(X11)**2 - (X12)**2] + [(Y11)**2 - (Y12)**2] / 2 (X12 - X11) = 0
Or (X11)**2 - (X12)**2 + (Y11)**2 - (Y12)**2 = 0 Or
(X11)**2 + (Y11)**2 = (X12)**2 + (Y12)**2

Substituting the values of X and Y Co-ordinates from the Construction, we get

(**O**G)**2 + (CG)**2 = (**O**H)**2 + (DH)**2 Or (**O**C)**2 = (**O**D)**2

Or **O**C = **O**D ----------(**11**)

If the Exogenous circle should have origin **O** (0,0) as its centre, , then the value **b** should become zero. Hence from (**06**) above,

[(X21)**2 - (X22)**2] + [(Y21) **2 - (Y22)**2] / 2 (X21 - X22) = 0
Or

(X21)**2 - (X22)**2 + (Y21)**2 - (Y22)**2 = 0 Or

(X21)**2 + (Y21)**2 = (X22)**2 + (Y22)**2

Substituting the values of X and Y Co-ordinates from the Construction, we get

(**O**I)**2 + (EI)**2 = (**O**J)**2 + (FJ)**2 Or (**O**E)**2 = (**O**F)**2

Or **O**E = **O**F ---------(**12**)

INFERENCE - 1 : **If both circles should have origin as their centre, then any two points on both circles should be equally distributed with reference to the junction of the lines connecting their centres and their points of inter-section.**

D. CONDITION # 2. BOTH CIRCLES TO HAVE EQUAL RADII WITH COMMON ORIGIN.

{ Note **2 Means Square }

If both circle should have equal radii then the condition is **a = b**. Substituting the values of a and b from (**03**) and (**06**) respectively,

[(X11)**2 - (X12)**2] + [(Y11)**2 - (Y12)**2] / 2 (X12 - X11) =

[(X21)**2 - (X22)**2] + [(Y21)**2 - (Y22)**2] / 2 (X21 - X22)

Multiplying both sides by 2, and Substituting the values of X and Y Co-ordinates from the Construction, we get

[(**O**G)**2 - (**O**H)**2] + [(CG)**2 - (DH)**2] / (**O**H - **O**G) =

[(**O**I)**2 - (**O**J)**2] + [(EI)**2 + (FJ)**2] / (**O** I - **O**J) Or

[(**O**G)**2 + (CG)**2] - [(**O**H)**2 + (DH)**2] / (**O**H - **O**G) =

[(**O**I)**2 + (EI)**2] - [(**O**J)**2 + (FJ)**2] / (O I - **O**J)

Applying the concept of direction,

- **O**H and **O**G are measured in opposite direction with reference to **O**.
- Hence (**O**H - **O**G) is equal to (**O**H + **O**G) or GH.
- **O**I and **O**J are measured in opposite direction with reference to **O**.
- Hence (**O**I - **O**J) is equal to (**O**I + **O**J) or IJ.
- Hence, (**O**C**2 - **O**D**2) / GH = (**O**E **2- **O**F**2) / IJ
- **O**C and **O**D are measured in opposite direction with reference to **O**.
- Hence (**O**C **2- **O**D**2) is equal to (**O**C **2 + **O**D** 2).
- **O**E and **O**F are measured in opposite direction with reference to **O**.
- Hence (**O**E**2 - **O**F**2) is equal to (**O**E**2 + **O**F**2).

If both circles to have a common centre as per (**11**) and (**12**) above, then **O**1 and **O**2 coincide with **O**.

Then **O**C = R1, **O**D = R1, the Radius of the Endogenous Circle, and **O**E = R2, **O**F = R2, the Radius of the Exogenous Circle. Hence,

[(R1)**2 + (R1)**2)] / GH = [(R2)**2 + (R2)**2) / IJ

If both circles should have the same radius, then R1 = R2 = **R**, where **R** is their common Radius. Hence,

2 (**R**)**2 / GH = 2 (**R**)**2 / IJ Or GH = IJ

<u>INFERENCE - 2</u> : If both circles should have equal radii and common centres, then the sum length of the components of any two points on both the circles, along the line joining their centres should be equal.

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BIBLIOGRAPHY - 1

Nobel Laureate in Economic Science Sir. W.Arthur Lewis (1915-1991)
Nobel Laureate of 1979 in Economic Science
St.Lucia/UK. Princeton University, Newjersey, USA.
Emeritus Professor, Department of Economics,
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Former President of the Caribbean Development Bank
(World Bank / UNDP Set-up). Barbados, West Indies.

Selected Economic Writings of Sir.W.Arthur Lewis.
Editor : Mark.Gersovitz. 1983

1. **The Slowing Down of the Engine of growth**
   (The Nobel Prize Lecture in Economic Science, Stockholm, Sweden, 1979).
   Pages 283-292.
2. **Development and Distribution. Pages 443-456.**
3. **Thoughts on Land Settlement. Pages 563-571.**
4. **A Review of Economic Development. Pages 653-668.**
   (Richard.T.Ely Lecture)
5. **The Shifting Fortunes of Agriculture. Pages 615- 622.**

BIBLIOGRAPHY - 2 { Author's Other Similar Research Publications }

A Redefined Productivity Model & Socio-Economic Development Oriented Management Decisions.
ALTIJARAH, Monthly Economic Magazine of the Sharjah Chamber of Commerce & Industry. UAE.
May 2001 - Pages 26 to 28, September 2001 - Pages 20 to 41, March 2002 - Pages 32 to 35.

Corporate Infrastructure for 5th Generation Computers.
INDIAN MANAGEMENT, Journal of the All India Management Association,. June 1985. Pages 19 to 28.

DR.VSR.SUBRAMANIAM

Mrs. Gandhi Gave New Economic Approaches. Barbados Advocate (Daily News Paper), Barbados, West Indies. January 8, 1985. Page 4 - Centre Page Article.

Other Past Publication References { 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/sedfull.htm**
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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).**
- **A Redefined Productivity Model and Socio-Economic Development Oriented Management Decisions. (See in : www.drvsrs.com/mgmtfull.htm)**
  ALTIJARAH, Monthly Economic Journal of the Sharjah Chamber of Commerce and Industry, UAE.
  May 2001 - Pages 26 to 28 (Part - 1).
  September 2001 - Pages 20 to 23 (Part - 2).
  March 2002 – Pages 32 to 35 (Part - 3).

DR.VSR.SUBRAMANIAM

- **Accelerate Your Socio-Economic Development : An Eccentric Bicircilar Model and Solution.**
  (See in : www.drvsrs.com/sedfull.htm)
  ALTIJARAH, Monthly Economic Journal of the Sharjah Chamber of Commerce and Industry, UAE. April 2000 - Pages 36 to 38 (Part 1). May 2000 - Pages 44 to 48 (Part - 2). June 2000 - Pages 43 to 44 (Support Diagrams). July 2000 - Pages 42 to 44 (Geometric Solution and About the Author).
- **Corporate Infrastructure for Fifth Generation Computers.**
  (Based upon a survey of Computer Hardware / Software Developments in USA and Japan) Indian Management . June 1985. Page 19 - 28.
  (See in : drvsrs.com/compinfra.htm)
- **Mrs Gandhi gave New Economic Approaches.**
  Barbados Advocate, Barbados. West Indies. January 8, 1985. Page 4 (Centre Page Article) (See in : www.drvsrs.com/igandhi.htm)
- **Socio-Economic Development – A Politico-Financial Over View. See in : www.drvsrs.com/polifina.htm**

1 2 3

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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Source : www.drvsrs.com/viewer01.htm

Socio-Economic Development (SED) Feedback 01

Kanthimathi, Rural Housewife, Tirunelveli, Tamil Nadu, India. 24th December 2001. { Topic : Socio-economic development }

I am a housewife living in a rural district head quarters. I am not given enough chance to study, eventhough I wish to. I am convent educated. So I know some good English. My friend has computer and internet. She has done economics. Now she is doing business administration. She showed your Web site and the article in "Accelerate your Socio Economic Development" and "Productivity and Management Decision".

So I was interested to find what you have to say to remove the low standard of living for people like me. With my friend I went to Parama Kalyani College in a village called Alwarkurichi, my native place in our district. We requested the Economics and the Mathematics Professors to tell us what you have written in the internet.

We come to know that you want the government to encourage the local people to do the local production work. Also you want people to save. Government money has to be used to improve local industries. The country should not depend on foreign help every year. Government has to keep the development of the people and their satisfaction as a rule to find the value of money spent every year.

Every one's value and calamities in life has to be taken as important, and people have to be protected from suffering. All these are good only in a paper.

I know of accelerator in our rural buses, we use to travel for hours in dust and crowd. Socially we are suppressed. Economically we are poor. Prices are going up every day. We are not able to buy the daily food articles. Employment opportunity is not there. If it is there it is based on cast.

How it will help a person like me by your writing a mathematical paper like this in the internet ???

My Reply

In your own sweet rural and village language, you have beautifully translated what I say in my internet paper. I will answer you on Acceleration, Social suppression and Economic poverty.

Like a bus accelerator pushing the bus with more speed, the village level economy has to go forward day by day. For this the Government should use the number of people able to buy their food items in a day, in each rural village as a scale to measure the effect of their supply. Also number of jobs created should be valued on the total population in an area and not on cast basis. This is not happening as I say in my Internet paper. So the bus goes forward and the people are left behind.

{Dividing people on Cast or Race is called Apartheid . It is againt human rights in the world. It was in South Africa, and fought and ended by people like Nelson Mandella. It was in USA, and fought and ended by people like Matin Luther King Junior. Britishers did this on Black & White colour basis. This was ended by people like Mahathma gandhi. It is a pity to find that it continues in India, and there is nobody to end it, even in 2000s}.

Suppressed society cannot progress. The feeling of suppression should go. For this the people in each village have to think ways for better living. This is possible by co-operative farming. All the villagers (say 100 people) having small pieces of agriculture land (say 1 acre each) in one place have to join and make one big land (100 acres). Farming is to be done like a production in a factory, by hiring tractors and other agricultural machines, fertilisers etc...

Each farmer owner has to work for this. I am sure the local government and rural banks will help for this, by way of advance money. The income from sale (say 100,000) has to be shared by the acre given by each (100,000 / 100 X 1 = 1000 each). This is also called Motivation and Innovation (Please See these in my Internet Page). Each one in a society must join together, think and work. Then only the suppression will go. This is what I say in the Internet as local resources and local man-power has to be used to support the local social and economic development. Government alone cannot do it.

Economically poor is because of low production of needed items, more population to eat, and price rise is accepted by the people as a part of their life. There are no people to join together, think and do something to bring down the prices.

Government along with the good-will of their employees can become efficient and do this in their area like Public Buses, Railway service etc... to bring the travel ticket cost cheaper. But both should realise, understand and work. Similarly I have given an example of co-operative farming above for the village people. In the Internet I say that all the work and actions to be measured with Social and Economic development result as a reference. This is my new way for Productivity theory.
This Letter also may of Interest to you. Click on this : Madhavan

Source : www.drvsrs.com/viewer01.htm

Socio-Economic Development (SED) Feedback 02

Nesreen Al Khathib, Student in Economics, Minya, Egypt.
3rd February 2002. { Topic : Socio-economic Development }

Education with internet search assistance is the education of the day. Now I am on holidays back home. I am a person in economics and management studies. I am scanning the internet now a days for understanding how to perform well in both as myself and in my future jobs.

I read your news report collection in the support topic on your "concepts" in Jordan heading. Jordan has educated people and their king has good management for the country. There is also local help from banks for money.

Also I saw your personal career. From both I understand, education is important for progress. This is important for each and every country.

In a country like us in Egypt, do you think educating all people will improve the living condition and we can reach a good development ?

My Reply

I am happy to find young persons like you are thinking with a broad and big way about improving the "living conditions" and "good development". I am calling the good living condition + some happiness + satisfaction as "Social development". The "good development" to get food, clothing etc.. for all within their earning, is called by me as "Economic development". Both joined together is "Socio-Economic Development". I use the word "Domestic" to point the "Local". As an student of Economics you should be knowing this.

My Research and Innovation to get both by any and everybody in a nation is

- **Latest technology made to fit local conditions should be controlled and used by Local manpower.**
- **Local money investment has to be from Local savings (Do not depend on foreign help always)**
- **Treat local development goals as important to measure the Effectiveness (Or Productivity) of any activity in the country.**
- **Attach more value to the natural, social, international and peoples' activities and needs (Intangibles) than quantity and money aspects (Tangibles).**

Citing Jordan's progress quoted in my support, and my personal education list, you feel that education is the only key for such progress.

I wish to say that Education is one of the key for progress. It helps the local manpower to use and control the local management, technology and production. Education is one thing and application of the knowledge is another thing.

There are nations, which are not that forward in education. But prosperous in social and economic areas (Example : China, Japan, Korea, Taiwan). If you see any computer item, they are the makers !!. Also nobody can challenge them at their low price !!!. This is because of their hard work and motivation. They are able to learn high technology, think and use it for their own progress.

There are also nations with highly educated people and still in poverty line. (Example : Bangladesh, India and Srilanka). All their educated people are in USA, Middle East, Europe or in other countries, using their education and hard work for the benefit of these immigrated countries than their own. I also find a number of educated and hard working Egyptians in different parts of the world.

Jordan is a special nation using the education for their own good. Jordanians abroad are also doing business to benefit their country.

Even Egypt is a historically prosperous nation. From Ahmose, the Pharaoh of 1550 BC to 1525 BC, the Nile Valley civilisation developed a golden empire, and Pyramids in Cairo are engineering wonders. People were able to use such a high and precision construction ability, about many thousands of years before (Local manpower with Local technology). Even now, any Arabic movie or TV serials is a product of Egypt, and the best actors/actress/producers in Arabic serials are Egyptians. Historically music and dance started from the Egyptian "Gypsies" and spread all over the world. All these are marks of good living conditions and good development. But where it has gone ?

Getting the education is not the tool for better living conditions and good development. Knowledge from education should be used. Many times the knowledge is mis-used. On 22nd April 2002 (Monday) I was watching an Arabic serial in Cairo TV (2.30 AM GMT). It is a comedy, about a man (TV serial has given his name as Mohsen), who is not that qualified, living in peace and happiness with his wife in a flat. His neighbours are qualified Medical Doctors, one is a Psychiatrist (Mental doctor) and the other is a Biologist (Germs and virus). These educated persons are not enjoying that much of peace and happiness, as they are busy in their profession and not caring for their home and family. They call Mohsen as a Romantic lover. The Psychiatrist feels that Mohsen is suffering from a histerical idiocy (mentally wrong), and the Biologist feels that some virus has entered into the body of Mohsen, and that is why Mohsen is feeling happy. Both do not understand that happiness is a birth-right of everybody, but used their educational specialty to see it from a wrong-angle.

This is what is happening to the educated in all developing / under developed nations. The education is used in selfish / twisted ways, without understanding the vast amount of happiness, wealth and opportunity available in their own country. Educated people escape out of their country for their selfish gains. Even if they understand, they do not wish to spend their time and energy to make good of it.

This needs a Group work, Motivated and Innovative approach. That is the essence of my research work Concepts and the object of my Web-Site.
I have not come across any effective news items related to the Socio-Economic development status of Egypt, within the range of my news channels. I will search for it, and include in my "Concept support", as well as provide a click-link below this reply, at the earliest.
Click on these to See : Innovation Motivation
These Letters also may of Interest to you. Please Click on these : Kanthimathi Madhavan

Source : www.drvsrs.com/viewer01.htm

Socio-Economic Development (SED) Feedback 03

Peter Kemoli, Department Supervisor(Government Servant), Mongu, Zambia, Africa. 10th September 2002.
{Topic : Socio-Ecpnomic development}
In the world, as in Zambia, the local government gives "housing loan". This is given to uplift a medium level family from poor living to a comfortable higher living.

I analysed this loan scheme and found out that it is not actually giving either the uplifting or the comfortable living.

Let me explain the process. Say a medium class government servant like me is getting a housing loan of 10,000 Dollars to build a house in the ancestral site, with interest free. This is a long-term loan and the government want it back in 20 years. To meet it, Dollar 41.66 is deducted form the salary every month, so that (Dollar 41.66 X Months 12 X Years 20 makes 9,998.40) + extra deduction of Dollar 1.60 at the last month makes Dollar 10,000.

You should note that during the 20 year period, the government servant is not owning the house, and spends his time in paying for it. When he really owns the house on the 21st year, the house is fully depreciated and its value is zero.

Plus he is 20 more year old with a liability to repair a fully depreciated and bad house. Is there any social development for the person or is there any economic development for his family ?

My Reply

Every government as well as the Economic Development Institutions like Commonwealth, IMF, Regional Development Banks, World Bank and the UNDP help the local house-holds by providing house loans with interest free and very long term repayment facility.

You have correctly expressed the view point and the feelings of any medium class government servant in any part of the world. I wish to analyse the same from the following 3 angles.

1. External (Tangible) Economic Analysis.

If one views the loan as a piece of amount given by the government to a medium class person, and taken back by the government, then it is a simple external peripheral outlook. Let us analyse this monetary transaction in a little more in depth.

The government has given a loan of Dollar 10,000 without any interest. Let us say that the same loan is taken by a medium class person from any private lender or a bank, at a nominal simple interest of 8 per cent per year. Then the interest for 20 years will be (10,000 X 8/100 X 20) Dollar 16,000 which is more than 1½ times the loan amount, plus the loan of Dollar 10,000 has to be repaid. So the person has an economic gain of Dollar 16,000 in 20 years.

On the other hand let us say the person has hired a house at a nominal rent of Dollar 50 per month. The rent for 20 years will be (50 X 12 X 20) Dollar 12,000. (This is under the assumption that the rent has remained the same for all the 20 years, while the trend in any country in the world is that the rent is in an increasing trend). The medium class person should pay it or the employer (government or private) should pay it as a house rent allowance. Also at the end of 20 years, a sum of Dollar 12,000 has benefited a third person who gave the house on rent, and the medium class person is left without any house, to call it as his own.

This supports my Exogenous concept of a domestic individual investment by getting a loan and repayment, even-though it started with an external government source.

2. Internal (Intangible) Social Analysis.

The government has given a loan to a medium class person to build a house in the ancestral property. Through this assistance, the medium class person has gained the following personal and social comforts :-

A. **To plan, design, construct and live in a house with the options, liking, suggestions and comfort of all the family persons.**
B. **During the period of 20 years, the government does not claim the ownership of the house, as well as does not create any inconvenience or discomfort to the medium class person and his family living there.**
C. **Even though the medium class person pays back the loan to the government through a nominal sacrifice of 41.66 Dollars in the monthly income, the medium class person enjoys the full and guaranteed ownership.**
D. **The government also enforces certain safety clauses like the person should not sell or mortgage the house till 20 years, which is in good faith and to escort for the medium class person to ensure the continued possession and ownership of the house.**

This supports my following Economic concepts :-

Endogenous concept to build and possess a residential infrastructure created by a domestic construction effort, with domestic manpower resources.

Government (Management) decision to consider intangible psychological and social benefits for people as more superior than tangible monetary and quantum aspects (like getting a higher interest return).

3. Post Repayment status.

After 20 years, the loan is fully repaid. At this point the medium class person fully owns the house with free will to repair, mortgage or sell.

But this real estate asset is acquired with a nominal payment of 41.66 Dollars per month. It has induced an indirect advantage of domestic saving potential for the medium class person, by drastically reducing the monthly deductions and increasing the monthly disposable income.

If the medium class person saves about 50 Dollar per month towards the repair and maintenance of the house, in 20 years it will accumulate to a sum of (50 X 12 X 20) 12,000 Dollars.

If the amount saved in each year (50 X 12 = 600 Dollars) is kept on a fixed deposit with compound interest, the sum accumulated at the end of 20 years will be quite large .

20 years is a fair and sufficiently large time period to bring up, educate, and employ a son or daughter, who can contribute to revive and repair the fully depreciated house.

This supports my Productivity concept to consider the Social Return on investment as more important than Monetary Rate of Return.

Source : www.drvsrs.com/viewer01.htm

Socio-Economic Development (SED) Feedback 04

Arun.S.Patel. (Section Head - Finance Department), Government of Gujerat, Ahmedabad. Gujerat. India. 4th November 2002. {Topic : Socio-Economic Development}

As a state government servant I was interested in your published work related to the Social and Economic development as well as on Productivity in www.drvsrs.com.

At a national level, you have rightly inferred that the dependency on foreign assistance and help should be progressively reduced and brought to a "nil" situation by improving the domestic savings to support the domestic investments, and local manpower should be made to handle the local technology, as well as the productivity should be measured with reference to the Socio-Economic development units.

After a careful analysis of your research findings, I have come to a firm conclusion that these concepts are important for the progress of government sub divisions like the States, Districts and Villages. Let me explain how it can work.

It has become a practice that the villages look forward to assistance from district, the districts look forward to assistance from the state government and the state governments look forward to assistance from the central government. This situation will change for the better if your concepts are applied.

1. **The villages should progressively reduce their dependency on the district and bring it to a "nil" situation by improving the village savings to support the village investments, and village manpower should be trained to handle the agriculture and village industries. Also, the productivity within a village should be measured with reference to the Socio-Economic development goals of the individual village.**
2. **The districts should progressively reduce their dependency on the state government and bring it to a "nil" situation by improving the district savings to support the district investments, and district manpower should be trained to handle the district industries and business. Also, the productivity within a district should be measured with reference to the Socio-Economic development goals of the individual district.**
3. **The state governments should progressively reduce their dependency on the central government and bring it to a "nil" situation by improving the state savings to support the state investments, and state manpower should be trained to handle the industries and business at a state level, Also, the productivity within a state should be measured with reference to the Socio-Economic development goals of the individual state.**

But in a country like India with many diversified population groups, if the term local manpower is restricted to those who are the natives of each village, district or the state, peaceful co-existence and development will be jeopardised. I can tell you how it can be solved, by broadening the definition of the word "local manpower", without any nativity, language, religious or cast constraints.

a. **It is a person born in the country and contributes a productive work and savings for the development of the living locality, irrespective of their nativity and origin within the country.**
b. **Nativity by birth in the locality should be given priority for training and employment, and wherever there is a gap of a particular trade or experience at the local level, manpower from the near by locality can be obtained.**
c. **Mass training could be conducted at the district and state level, to upgrade the human potential at all levels.**

My Reply

My concepts on Exogenous balancing of Domestic savings to support Domestic investments and Endogenous synchronisation of Domestic manpower to handle (moderated) Domestic technology is developed for a Macro national level. Productivity redefinition with reference to Socio-Economic development goals, is a prime need to balance the development gaps at Macro international level.

I am happy to find that an ingenious person like you in a responsible government assignment could find an application of my concepts to the Micro State, District and Village level. You have really broadened their scope and their utility.

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