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DEVELOPMENT ACCELERATION A PRACTICAL METHODOLOGY



**DEVELOPMENT ACCELERATION
A PRACTICAL METHODOLOGY**

BY

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BASIC NEEDS OF PEOPLE IN ALL NATIONS



A. FOOD - EATING MATERIALS + WATER +MILK



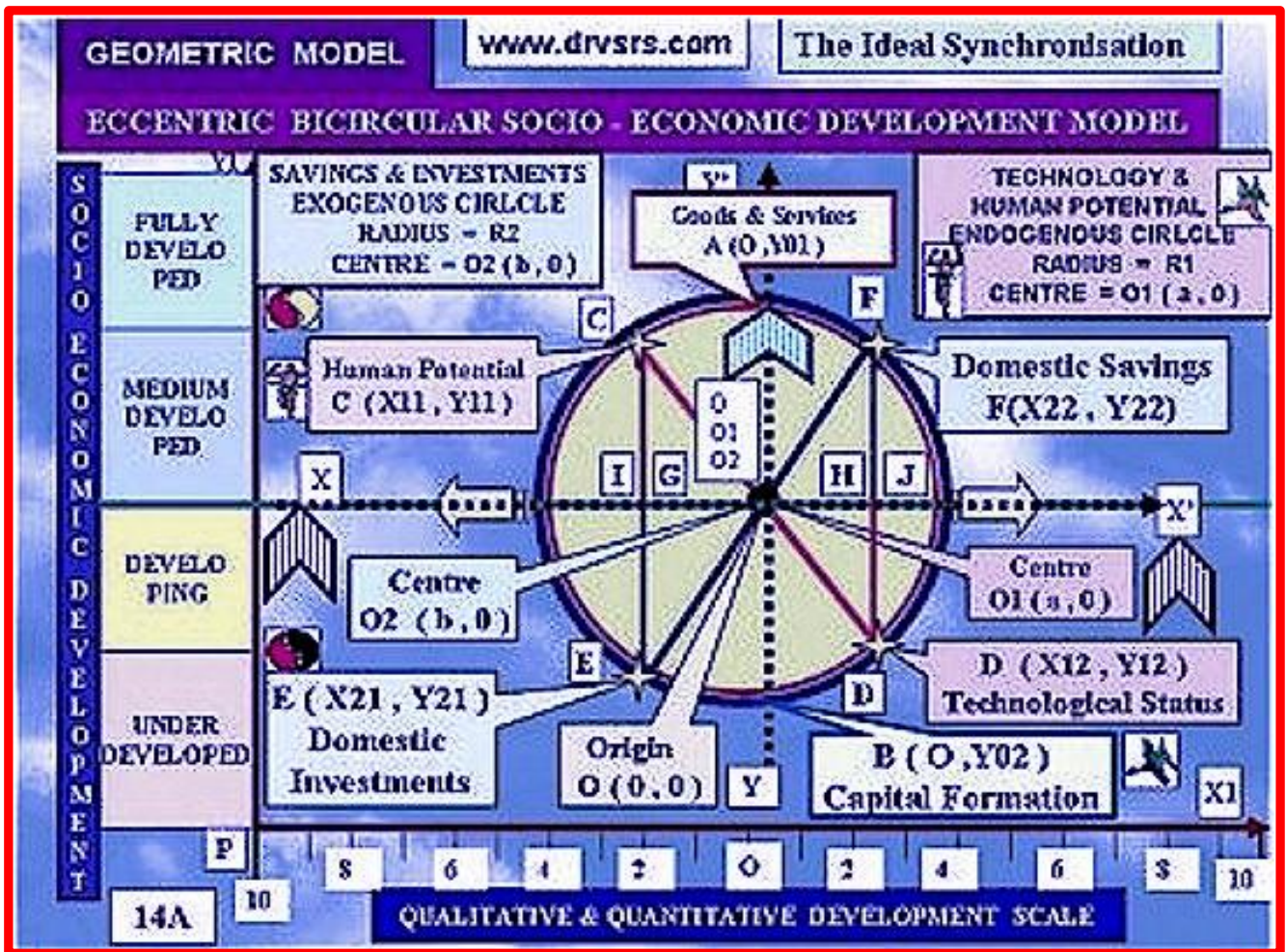
B. CLOTHING FOR ALL MEMBERS OF THE FAMILY



C) A HOME TO LIVE (SHELTER)

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Optimum synchronization of Geometric Model



**ACCELERATE YOUR DEVELOPMENT
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**ACCELERATE YOUR DEVELOPMENT :
A PRACTICAL METHODOLOGY**

PREFACE BY THE AUTHOR

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The nations in the World are always divided into 3 Main brackets, and accordingly their population acquires their living standards, and shares the Prosperity and Poverty around. That division is Developed, Developing and Under-Developed.

It is a surprising fact that the un-quantifiable strides in the World Techno-Commercial advancement has moved the people from Bullock Carts / Horses into Buses / Aero Planes. Strides in Scientific Research has eradicated the diseases, which once needed a vaccination certificate, when landing in any airport in the world. This has happened to all nations in the world, within a span of half a century (1950 to 2000), irrespective of their level of advancement. It is because of the fact that Techno-Commercial and Scientific Research applications are practical, pointing to the Tangible (Quantifiable & Controllable) aspects, mostly need based, and the cost is considerably subsidised and minimised by many nations.

But, it is yet to see any Developing nations becoming Developed, and the Under- Developed one had moved up in the ladder toward Developing and Developed status, in the past one century (1900 to 2000). In most of the world nations, 50% to 75% of the people are still below poverty line, and not able to get their basic needs (Clothing, Food, Shelter and Water). It is because of the fact that Research and Development in Economics and Management are not Mass or Welfare oriented and they are only nation oriented. They guide national policies and not provide any solutions for the people's problems. They are mostly theoretical / statistical based analysis and inferences, pointing to the Intangible (Non-quantifiable & Non-controllable) aspects and hence they are non-practical.

This Socio-Economic development is NOT imposed by any external agency, but self-created by their own internal population, with their inability to identify and follow the methodology to come out from the shell of their current status.

Is there any secret strategy to cross the barrier and race from the Under-Developed towards the target of Developed status ?

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This Research work locates that secret strategy, quantifies them into Mathematical units, solves them and offers a magic pill solution for all nations in the World :-

- The Developed Nations to maintain, and further upgrade their status.
- The Developing Nations to become developed and progress.
- The Under-Developed nations to catch the path towards the Developing infrastructure and ultimately to reach a Developed status.

First of all we should understand the dimension of development!! The basic unit for this, is Self-satisfaction and Happiness of every house hold. The ingredient for these, is the *savings* per month, by each house hold. Savings results in surplus money in hand, paving a path for Self-satisfaction and Happiness. Savings is an arithmetic difference between the monthly income and the cost of basic needs per house hold per month. The basic needs are Food (including water and milk), Shelter and Clothing.

If the savings per month is positive, the nation is *developed*. If it is null, then the nation is *developing*. If the basic needs are not available, then the nation is an *Under developed*. This is the driving force to motivate people in developing and under-developed nations to migrate towards developed nations!! Once a trend is achieved for domestic savings among domestic households, then it should be attracted and used for domestic development.

The secret approach to use these 2 internal ingredients, for development is

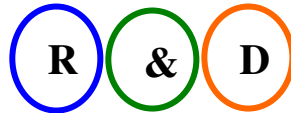
1. Domestic Investment balancing with Domestic Resources.
2. Domestic Technology balancing with Domestic Manpower

The contents of this Research work directs the approach to close the gap existing between the two components in each of 1 and 2 above, using a Geometric model.

These components in this Research work is based on the past Research & Development experience of the Author, with a special orientation aptitude and experience in the international Socio-Economic Development Institutions. The Nations which follow the inferences in this work, are guaranteed to maintain their current Socio-Economic Development status and drastically uplift their degree of Development.

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This Research work should be in the possession for Reference and Implementation guide lines with All World Government Heads, Ministers and Administrative Heads (Village, District, State, Nation), Private & Public sector Management personnel, Colleges & Universities, Economics & Management Students, Research Scholars, Lecturers and Professors, Social Workers and Public Service personnel, International Development Agencies like Commonwealth, IMF, Regional development Institutions (ADB, CDB, IFC, ICICI etc.), UN and the World Bank.

KEY WORDS

Acceleration, Bi-circular Model, Decision Methodology, Developed, Developing, Domestic, Economic Development, Econometric Model, Geometric Model, Investment, Management, Manpower, Productivity, Savings, Social, Development, Socio-Economic Development, Technology, Under Developed

JEL CLASSIFICATIONS

A13, B41, B46, C51, C52, C61, C67, D78, D84, F43, M21, M33, O11, P27

SYMBOLS USED

f or F = Function of Σ = Sigma (Summation)

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ABSTRACT

The prime Economic classification of the nations are "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 status. This condition was correctly questioned by the Nobel Laureate in Economics (1979), Sir. Arthur Lewis (1915-1991) as "Is the dependence of the developing country world growth on that of the developed - world inevitable ?". Development is found to be directly related to the savings among domestic households. Saving in turn, depends of the cost of essentials needs, namely Food, Shelter and Clothing. People migrate towards nations providing a saving platform. The current trend among the developing nations is to attract foreign investment in their nations with many economic incentives. This is another form of dependence with profit oriented corporate units, providing only large volume employment and without any mandatory commitment to upgrade the domestic techno-commercial and economic infrastructure. A review of the seven steps of corporate operations confirm a Closed Cycle Economics, operating in all the nations, irrespective of their political pattern, and controlled by three resource dimensions. In each of these steps, these three components are existing in different forms, This cycle controls and monitors the Domestic consumption, Domestic investments, the economic indicators and hence the GDP.

With these thoughts as a basis for discussion, the need for a new dimensional approach was exposed to a team of 14 diversified, but critically responsible persons in different nations, committed and working towards an accelerated Socio-Economic development. Based on all these approaches, this Geometric model is developed.

This model using Geometry to the faculty of Economic Science, attempts to make this linkage more eternal than inevitable. This needs a multi-lateral approach to boost the domestic savings to support domestic investments, and to improve the quality of domestic human potential to man the domestic technology.

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Both these should be maintained and monitored by the optimum infrastructure mix. Techno-commercial systems assist to reduce the effects of these constraints, develop the technology, and optimise the resource utilisation. This 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 represents the external entrepreneurial activity, designated as "Exogenous", and the latter involving internal productive activity, designated as "Endogenous". A geometric approach is used to solve these two intersecting circles, aiming towards the central objectives of integrating the Exogenous and Endogenous aspects. This will upgrade the socio-economic status, and enlarge 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 in the world developments. Any attempt to upgrade the existing Endogenous aspect only or Exogenous aspect only, is bound to create an unfavourable disturbance in this synchronisation. 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.

NOTE :

The unit for the measure for development is “saving” by each household, including the lowest wage earner group (labour class). The Basic needs are Food (including water and milk), Clothing and Shelter. If the average monthly earnings of each household can buy their basic needs and there is a saving, it is an indicator of a developed nation.

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If they cannot buy their basic needs, it is a Developing nation, If the basic need items are available, it is an under developed nation. The developing and under developed nations should concentrate on the continued availability of basic needs and their monthly cost should be lesser than the average monthly earnings of every household. Attractive incentive should be provided to invest the domestic savings in Banks and Government bonds and they should be used for Domestic development projects.

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01) ETERNAL LINKAGE

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

This was a question raised in his Nobel prize paper in economic science "The slowing down of the Engine of Growth", 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). He was the President of the Caribbean Development Bank, Barbados, WI, where I was the "Consultant Adviser". The possible solutions suggested by the Noble Laureate for an independent rate of growth for 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.**

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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) MULTI NATIONAL INVESTMENT APPROACH

- A) Many nations attract foreign industries with tax free and money repatriation facilities. The attraction in this method is that there is no capital investment from the domestic sources, and it creates a large employment potential for the domestic experts and labour.**
- B) The foreign investor will continue till the project period or till the environment is providing an advantageous financial rate of return for them. Then, they will close down, without any economic or social rate of return to the country of operation, as they are exempted from direct and indirect local taxes and other payment liabilities.**
- C) Borrowed investment, through assistance from World bank, IMF etc. have to be repaid. Unless the assisted nation becomes strong enough to domestically generate a sizeable return on such investments, the nation becomes a debtor (Every developing and under developed nation today is in such unrecoverable debt trap. Even developed nations are moving towards this). The public may not be knowing that these loans have some hidden traps and conditions, not palatable by the receiving nation. Also the utilisation and implementation of the funded projects remain in the hands of the government, a bureaucrat, slow decision maker and a non-productive / non cost-benefit oriented public setup.**
- D) A good technical rate of return to the country of operation will result by a drastic indoctrination of the latest technical know-how to the domestic people. But these trained technocrats are not entrepreneurs to venture, take risks and start similar projects domestically. They are jobbers and immigrate to places needing their expertise and experiences, without any contribution to their home nation.**

03. MEASURE OF THE DEVELOPMENT STTUS OF A NATION

Representative Household is the total population including the lowest wage earners or the Labour class. The components which decide the development of any nation is the value of the Monthly Basic needs of a House hold (E**) versus their Earnings per month (**I**).**

The Basic needs are Food, Clothing and Shelter, as shown diagrammatically in Chart - 02.

- **If (**I**– **E**) is positive, then there is a Saving, an indicator of developed nation.**
- **If (**I**–**E**) is Zero or Negative, then there is no Saving, an indicator of Developing nation.**
- **If the basic needs are not available, then the nation is under developed.**

This disparity in classification is shown in the Household Survival Arithmetics in Chart-03. People from under developed and developing nations migrate to Developed nations to enjoy a saving opportunity!!! In turn this provides a status of “Cheap and Skilled labor” availability to the Developed nations !!!

04. ROOT FOR DEVELOPMENT ACCELERATION IS AVAILABILTY AND SAVINGS.

- **The absolute path for saving is in ensuring the availability of basic needs first.**
- **Then to reduce the cost of basic needs below the Average earnings from Top to the lowest level house hold or the Labour class.**

How to achieve the status of Monthly cost of basic needs are always less than the Househod earnings per month ?

It is through the Mandatory actions on Basic need items production and distribution, as shown in Chart-03.

A	Efficient Management	1	Cost Reduction
B	Improved Productivity	2	Overhead Reduction
C	Optimum Resource use	3	Wastage Reduction
D	Optimum Quality	4	Subsidise Local Price through Export

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Note : Export brings a large value for every unit, through the leverage of high Exchange rate. Efficient management includes Mass production methods also. Responsibility for the above actions should be on

- Elected representatives and Ministers.
- Appointed administrators at Village, District, State and National levels.
- Private owners & corporate units in Basic need manufacturing and Distribution in the developed nations, the above are practiced as a business ethics, leading towards a saving trend among the local public.
- In the Developing nations, the responsibility holders (both public and private) utilise the Basic need production and distribution as a captive income generation center for their wealth acquisition, luxury promotion and employ their kiths and kins at exorbitant salaries. They recover the resulting loss through a continual price increase methodology, and lead the public towards the path of Poverty (people who are not Offord to buy the basic needs).
- Developing nations avoid the responsibility to control and progressively reduce the cost of basic need items, and link their increase to a “Cost of living index”. Proportionate to this index, they give a wage increase to the households. It is a suicidal policy, leading towards a domestic inflation and increase the number of people below poverty line. (Example – India)
- In under developed nations, the responsibility holders export the Basic need items to Developed nations, where there is a large demand. They target towards self-wealth acquisition, leading the local population to suffer and die.

05. DOMESTIC SAVINGS – A SOURCE FOR DOMESTIC INVESTMENT

- Once the domestic saving trend is established as ($I > E$), then the national government should create incentive for the people to invest their savings, by offering at least 20% return (Double the investment in 5 years) through interest. This will provide a base for using Domestic savings for Domestic Investments. This should be implemented through the Central or Reserve Bank and other nationalised & private banks. In developing and under developed nations, the governments provide a very low interest rates to the public investments (like 7% to 2% per annum or even low).
- The government should have wizards to invest the public savings in domestic development projects, which can get a return more than 20%, to pay back to the public and a profit for the government.
- If there are no such wizards in domestic sources, they can hire them from UN, Commonwealth, World bank etc.. at no cost help, to implement and train domestic experts.

06) CLOSED CYCLE ECONOMICS

A comparative review of the productive activities that control the financial flow in any nation, indicates a pre-set pattern with seven steps.

- 1. The first step is the demand for goods and services from individual households for consumables, and capital items from corporate sectors. These needs are converted into deliverable outputs by the Research and Development activity.**
- 2. The second step is to plan for the raw and semi-finished materials.**
- 3. The third step is to locate and augment the sources for basic raw materials from infrastructure units, through the purchasing operation. control them through proper inventory systems, and process them through appropriate production process, manned and managed through appropriate Manpower Management systems.**
- 4. The fourth step is the Engineering and Technological conversion process through appropriate machinery, infrastructure and spare parts, utilising the operating and maintenance manpower.**
- 5. The result in the fifth step is the finished product or services, transported and delivered by the handling manpower. The handling and warehousing operations are optimised through Operations Research Models.**
- 6. The products and services in the sixth step reach the users, after proper packing through the forwarding media and marketing channels.**
- 7. The last and seventh step in the cycle is the consumption of materials and services, distributed and accounted by the financial and personnel manpower. These operations are managed and optimised through Cost-benefit and Management Information systems.**

This consumption in 7, links the cycle back to the demand generation in Step-1 and provides a Feedback on the demand situation. Please see Chart - 01

The above seven sequential steps confirm a Closed Cycle Economics operating in all the nation, irrespective of their political pattern, controlled by three resource dimensions namely the Manpower, Materials, and Techno-commercial systems. In each of these 7 steps, these 3 components are existing in different forms, This cycle controls and monitors the Domestic consumption, Domestic investments, and hence the GDP.

07) CONGLOMERATION OF EXPERIENCES.

With these thoughts as a basis for discussion, the need for a new dimensional approach was exposed to a team of 14 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 2018, 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, who contributed to the concepts of development for the developing nations..**
- 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 workshops 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 development thoughts in the current millennium has to be from within every nation than an unilateral external dependence. Also it should be synchronised with many latest techno-commercial innovations in different parts of the world.

08) STRATEGIC APPROACH

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

- The first approach is to strengthen the social harmony and smoothen the inter-country relationship, which 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 second is to motivate the local entrepreneurial skills, leading to the creation of industries of common economies of scale between groups of nations. This constitutes the quantifiable Tangible Economic Infrastructure T2.
- 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.

08A) INTANGIBLE INFRASTRUCTURE (T1 Refer to Link Diagram – 01)

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

T1 in turn is related to the social comfortability of each individual. Social comfortability of any 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 which contribute to the individual development through the medium of Social Comfortability. This is shown in the left half of *Link Diagram - 01*.

08B) 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 $T2 = \sum (E + C + F)$

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 - 01*.

08C) 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 - 01*.

09) THE OFF-SPRINGS

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

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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 $P = \sum N \{ 1 \text{ to } n \} \sum G \{ 1 \text{ to } g \}$, 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 - 01*, along with their upward relationship, towards infrastructure mix components.

10) 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 is 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.

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Similarly an optimum tangible infrastructure could strengthen the domestic resources by way of 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 promoting the 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.

11) TECHNO-COMMERCIAL SYSTEMS (Refer to Link Diagram – 02)

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, derived from 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 $RP = R1 + R2 + R3 + R4 = \sum R_z$ where Z is from 1 to 4.
- Total constraints TC, is a cumulative effect of the Internal constraints C1₁ to C1_n and External constraints C2₁ to C2_m, 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 $TC = \sum C1_n + \sum C2_m$

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- The balanced net sector productivity is hence given by $SP = (RP - TC)$

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 the 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 - 02*.

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 government and the banks should offer attractive interest and incentives for domestic deposits and investments)

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.

12) 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.

13) THE BI-CIRCULAR MODEL.

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 so there could not be any productive results. (Refer to Link Diagram – 03A).

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. (Refer to Link Diagram – 03B).

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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.

14) GEOMETRIC CONSTRUCTIONS ON THE DEVELOPMENT CIRCLES. (Refer to Link Diagram – 04).

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 an origin O (0,0), this graphic representation develops an Eccentric Bi-circular Socio-Economic Development Model, as shown in the Geometric Model Diagram 02. It is assumed that the radius of the Endogenous circle is R1, with its centre at O1 (a,0). The radius of the Exogenous circle is R2 with its 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.

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15) DEVELOPMENT OPTIMISATION

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

- A) Perfect synchronisation of Endogenous and Exogenous circles.
- B) Development upgrade from lower to higher levels.
- C) Dimensional development through qualitative and quantitative improvement.

15A) SYNCHRONISATION OF CIRCLES

The synchronisation of Endogenous and Exogenous circles 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 Diagram 02. The interpretation of the solutions are : -

15A1) 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. (Refer to Link Diagram – 05A)

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 deters a nation to be foreign dependent for its socio-economic development, after a reasonable period, even if it is necessary to start with.

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

15A2) Both circles should have equal radii with centers on the origin, to represent an integrated approach to the Endogenous and Exogenous aspects, under a common objective and central guidelines. (Refer to Link Diagram – 05B)

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.

15B) DEVELOPMENT UPGRADE

(Refer to Geometric Model Diagram – 02)

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'.

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.

15B1) Movement of the X - Axis upward \uparrow or attempts to improve the Socio-economic development status, is expected to result in the following. (Refer to Model Diagram – 02 & Link Diagram – 06A)

- 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.**

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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.

15B2) On the other hand, a movement of the X - Axis downward, ↓ or lowering the status of socio-economic development, is expected to introduce the following effects (Refer to Model Diagram – 02 & Link Diagram – 06B).

- 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.

15C) DIMENSIONAL IMPROVEMENT (Refer to Geometric Model Diagram – 02)

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'.

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

15C1) The qualitative improvement is exhibited by increasing the Radius R1 of the Endogenous circle with reference to the axis PX1, and the inferences are as follows (Refer to Model Diagram – 02 & Link Diagram – 07A).

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- 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.

15C2) The quantitative improvement in dimension is represented by increasing the Radius R2 of the Exogenous circle with reference to the axis PX1, the inferences are as follows (Refer to Model Diagram – 02 & Link Diagram – 07B).

- 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.

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The qualitative and quantitative capability of any status of socio-economic development could be improved by increasing the diameters of Endogenous and Exogenous circles. 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.

16) MODEL DIRECTIVES.

The geometric model leads to 2 distinctive inferences. The general directive points towards domestication of the investment with savings, to avoid the economic dangers of external borrowing and the associated indirect liability of the national population. The other guideline is the multi-lateral appraisal of the funded projects. Both are integrated to accelerate the pace of domestic Socio-Economic Development.

16A) GENERAL DIRECTIVES

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 center and periphery, this means that, a number of countries leave the periphery and join the center. Or, if they are specially linked to each other by preferential trade and currency arrangement, one may even speak of creation of a new center, 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 center 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.

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The Endogenous and Exogenous environment synchronisation could lead a nation towards optimum socio-economic development acceleration.

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. 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 in Link Diagram - 08

16B) DEVELOPMENT PROJECT DIRECTIVES

All international, regional and autonomous development agencies (like Asian Development Bank, African Development Bank, Caribbean Development Bank, Commonweal Fund for Technical Cooperation, IMF, World Bank, USAID etc...) distribute millions of dollars per year to different justified Projects in different parts of the world. But the guidelines to measure the productive after effects of the funding is “Unilateral – Financial Rate of Return (FROR)”, the popular accounting and audit dimension. This geometric model has expanded this dimension to a multi-lateral evaluation tools.

Any project should justify and set the measure of the post implementation impact with reference to a “4 dimensional Rate of Return (4ROR)”.

They are :-

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- a) **Economic Rate of Return (EROR)** : The contribution to the Economic development of the funding region like increase in GDP, Per-capita Income, Competitive price for essential needs (Food, Clothing & Shelter), Reduction in the per kilometer cost of travel etc.. This evaluates and justifies the project funding, to **uplift** the economic status of the funded region.
- b) **Financial Rate of Return (FROR)** : The current and the popular accounting and audit dimension of the net profit (Surplus) percentage on the total project investment. This evaluates and justifies the project funding, that the investment has **not gone waste** in the funded region.
- c) **Social Rate of Return (SROR)** : The contribution to the Social development of the funding region like increase in employment potential, number of educated children and working population, increase and improvement in hygiene and hospital facilities etc.. This evaluates and justifies the project funding, to **upgrade** the society in the funded area.
- d) **Technical Rate of Return (TROR)** : The contribution to the Technological upgrade of the funded region like, increase in the use of modern methods in agricultural and industrial sectors, introduction of automated / computerised methods, modern audio / visual educational tools etc... This evaluates and justifies the project funding, to **upgrade** the technology in the funded area.

NOTE : The author introduced and implemented these 4ROR technique in the Caribbean Development Bank, Barbados, West Indies, during his assignment as a “Consultant Adviser – Computer Services” (1982 to 1986). To precisely evaluate the total project cost, he designed an internet linked and innovative software named “Project Time Costing (PTC)”. This captured the time spent by each “Project Officer” in designing, meetings, field visits, in-house preparation, training etc... for the uniquely numbered projects, from their office or from any alien location. This converted the time spent into dollar value.

17. 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.

17A) 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.

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- ❖ **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 trained 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. In spite 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 and 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, at the cost of the poor nation's training.**
 - ❖ **Some leading nations possess Atomic Bombs, Satellite Technology and Space Research, 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.**

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- ❖ **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 the 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 advanced technology, but 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, Sports etc...), and develop the local skills in these area, with a vicious publicity and large domestic investments. This is a 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. As a result, these unproductive and much publicised personnel get into power, without any socio-economic development background or talents, and destroy the nation.**

17B) DEVELOPED NATIONS

- ❖ **The largest developed communist nations (USSR), 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 dissimilar nations have to break their walls to join with a common support nation (Germany), in order to re-integrate their socio-economic development in a proper way.**

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- ❖ **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 (UK, USA), 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 (UK), by investing in foreign lands, utilising the captive local human 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.**
 - A. 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.**
 - B. Close all visa channels to foreigners, and strictly control the entry, where there is adequate domestic human potential.**
 - C. 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.**

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18. 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 human alone. Reason is immortal, all others are mortal." Using his geometric foundations, this paper has attempted to provide enough "reason" for the philosophy and methodology to upgrade the status, and create / accelerate a self-sufficient existence for the 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 from 2001 and beyond.

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19. FOOT NOTE

DEVELOPMENT ACCELERATION - GEOMETRIC MODEL

SUMMARY OF CONCEPTS DERIVED

(See Model Diagram – 01)

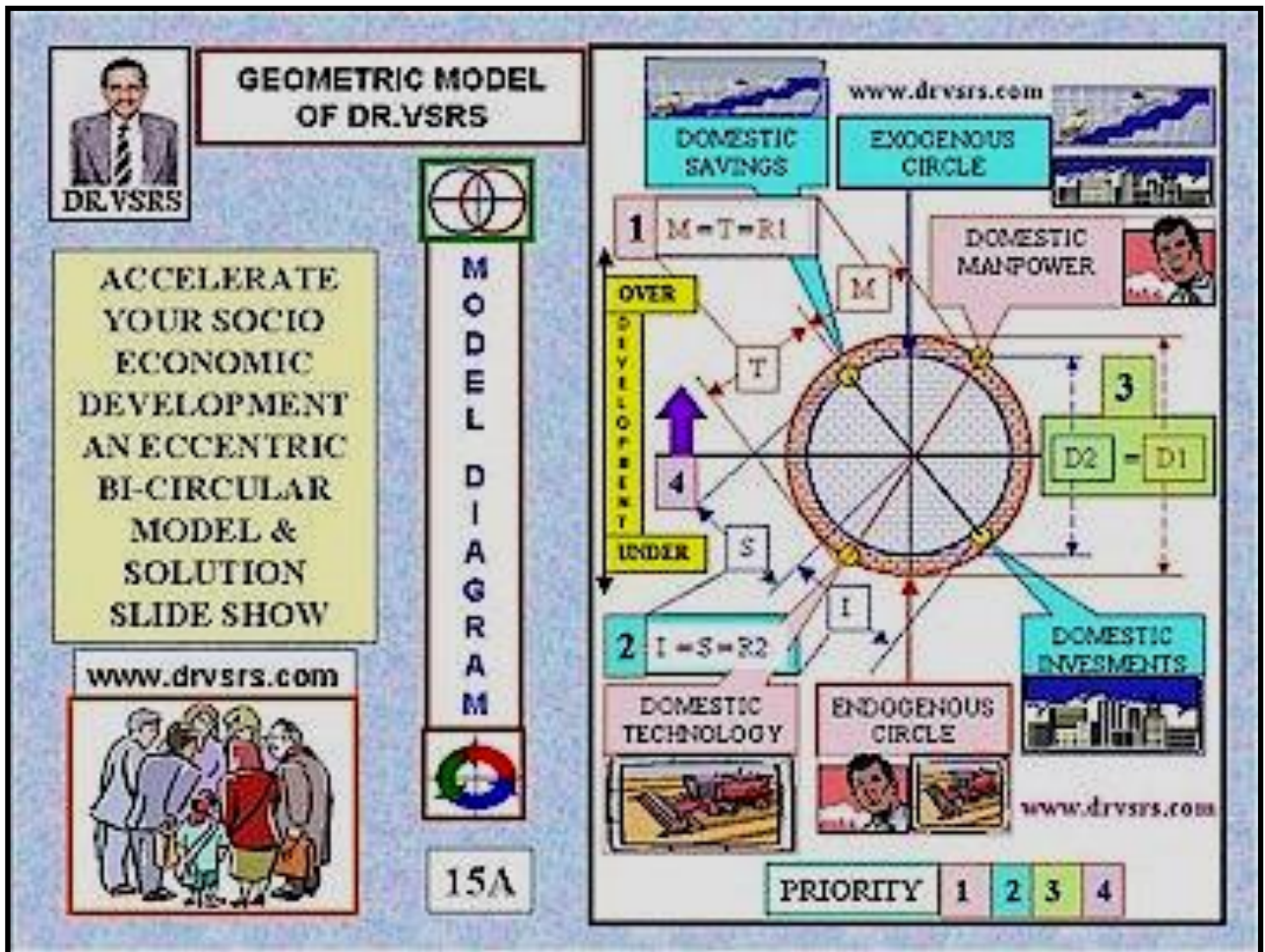
- ❖ **INDUCT DOMESTIC SAVINGS THROUGH COST CONTROL ON BASIC NEEDS (FOOD, SHELTER AND CLOTHING)**
- ❖ **DOMESTIC INVESTMENTS THROUGH DOMESTIC SAVINGS (INDIVIDUAL / CORPORATE / GOVERNMENT, EVEN THOUGH FOREIGN SOURCE TO START WITH) (EXOGENOUS CIRCLE)**
- ❖ **DOMESTIC HUMAN POTENTIAL TO MAN THE DOMESTIC TECHNOLOGY (LATEST TECHNOLOGY MODERATED TO SUIT LOCAL ENVIRONMENTS) (ENDOGENOUS CIRCLE)**
- ❖ **SYNCHRONISE EXOGENOUS AND ENDOGENOUS CIRCLES & OPTIMISE THEIR DIMENSIONS.**
- ❖ **This is Universally Applicable to All Developed / Developing Under-Developed Nations.**

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GEOMETRIC MODEL DIAGRAM - 01

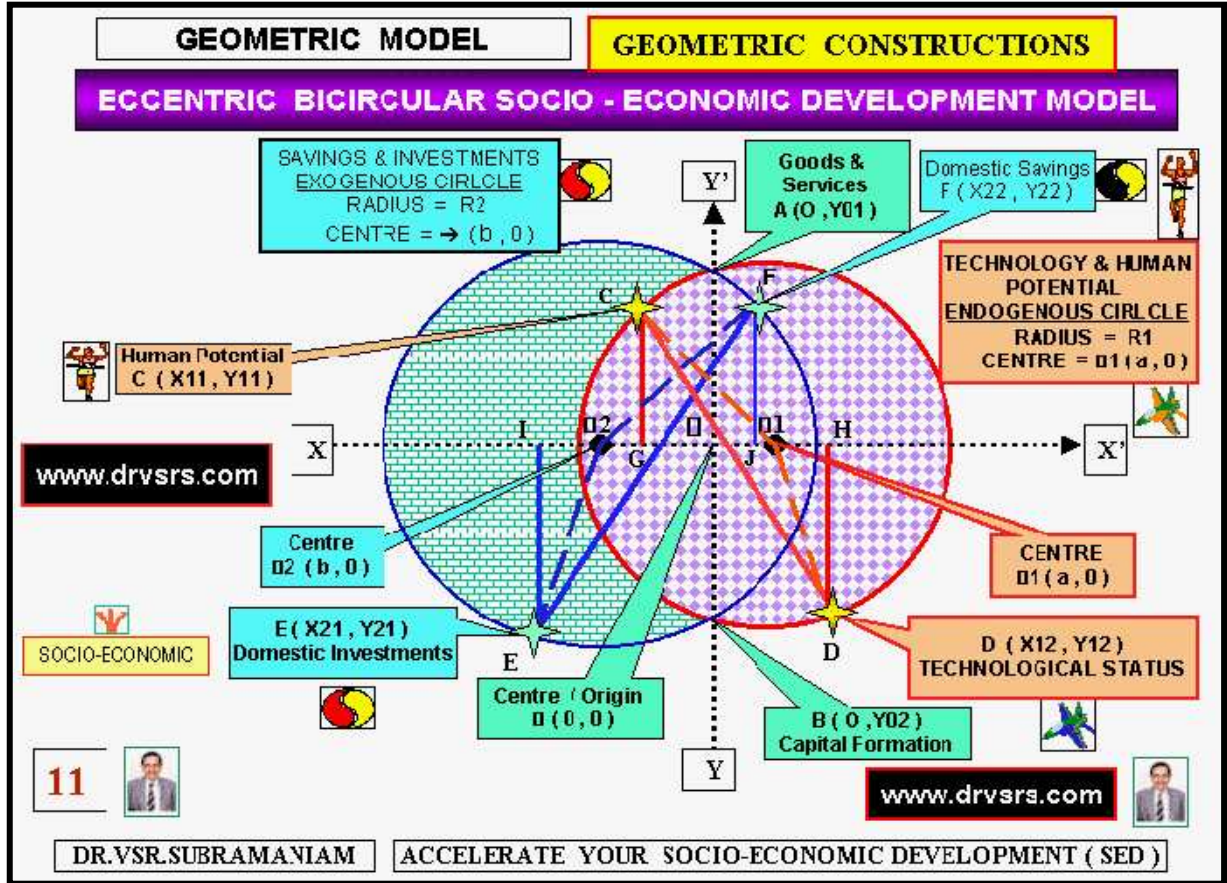
DEVELOPMENT ACCELERATION MODEL INFERENCES

SUMMARY SCHEMATIC



GEOMETRIC MODEL DIAGRAM – 02

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 $B (0, Y02)$. 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 center $(a, 0)$ and radius $R1$. By using the theorem of squares by Pythagoras,

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$$(X11 + a)^2 + (Y11)^2 = (R1)^2 \quad \text{Or}$$

$$(X11)^2 + (a)^2 + 2X11a + (Y11)^2 = (R1)^2 \quad \text{-----(01)}$$

$$(X12 - a)^2 + (Y12)^2 = (R1)^2 \quad \text{Or}$$

$$(X12)^2 + (a)^2 - 2X12a + (Y12)^2 = (R1)^2 \quad \text{-----(02)}$$

Subtracting (02) from (01)

$$[(X11)^2 - (X12)^2] - 2a(X12 - X11) + [(Y11)^2 - (Y12)^2] = 0$$

or

$$2a(X12 - X11) = [(X11)^2 - (X12)^2] + [(Y11)^2 - (Y12)^2] \quad \text{Or}$$

$$a = \frac{[(X11)^2 - (X12)^2] + [(Y11)^2 - (Y12)^2]}{2(X12 - X11)} \quad \text{-----(03)}$$

B2. EXOGENOUS CIRCLE. { Note **2 Means Square }

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

$$(X21 - b)^2 + (Y21)^2 = (R2)^2 \quad \text{Or}$$

$$(X21)^2 + (b)^2 - 2X21b + (Y21)^2 = (R2)^2 \quad \text{-----(04)}$$

$$(X22 + b)^2 + (Y22)^2 = (R2)^2$$

$$(X22)^2 + (b)^2 + 2X22b + (Y22)^2 = (R2)^2 \quad \text{-----(05)}$$

Subtracting (05) from (04)

$$[(X21)^2 - (X22)^2] - 2b(X21 - X22) + [(Y21)^2 - (Y22)^2] = 0$$

Or

$$2b(X21 - X22) = [(X21)^2 - (X22)^2] + [(Y21)^2 - (Y22)^2] \quad \text{Or}$$

$$b = \frac{[(X21)^2 - (X22)^2] + [(Y21)^2 - (Y22)^2]}{2(X21 - X22)} \quad \text{----- (06)}$$

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,

$$[(X11)**2 - (X12)**2] + [(Y11)**2 - (Y12)**2] / 2 (X12 - X11) = 0 \text{ Or}$$

$$(X11)**2 - (X12)**2 + (Y11)**2 - (Y12)**2 = 0 \text{ Or}$$

$$(X11)**2 + (Y11)**2 = (X12)**2 + (Y12)**2$$

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

$$(OG)**2 + (CG)**2 = (OH)**2 + (DH)**2 \text{ Or } (OC)**2 = (OD)**2$$

Or **OC = OD** -----(11)

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

$$[(X21)**2 - (X22)**2] + [(Y21)**2 - (Y22)**2] / 2 (X21 - X22) = 0 \text{ Or}$$

$$(X21)**2 - (X22)**2 + (Y21)**2 - (Y22)**2 = 0 \text{ Or}$$

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

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

$$(OI)**2 + (EI)**2 = (OJ)**2 + (FJ)**2 \text{ Or } (OE)**2 = (OF)**2$$

Or **OE = OF** -----(12)

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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,

$$[(X_{11})^{**2} - (X_{12})^{**2}] + [(Y_{11})^{**2} - (Y_{12})^{**2}] / 2 (X_{12} - X_{11}) =$$

$$[(X_{21})^{**2} - (X_{22})^{**2}] + [(Y_{21})^{**2} - (Y_{22})^{**2}] / 2 (X_{21} - X_{22})$$

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

$$[(OG)^{**2} - (OH)^{**2}] + [(CG)^{**2} - (DH)^{**2}] / (OH - OG) =$$

$$[(OI)^{**2} - (OJ)^{**2}] + [(EI)^{**2} + (FJ)^{**2}] / (OI - OJ) \text{ Or}$$

$$[(OG)^{**2} + (CG)^{**2}] - [(OH)^{**2} + (DH)^{**2}] / (OH - OG) =$$

$$[(OI)^{**2} + (EI)^{**2}] - [(OJ)^{**2} + (FJ)^{**2}] / (OI - OJ)$$

Applying the concept of direction,

- **OH** and **OG** are measured in opposite direction with reference to **O**.
- Hence $(OH - OG)$ is equal to $(OH + OG)$ or **GH**.
- **OI** and **OJ** are measured in opposite direction with reference to **O**.
- Hence $(OI - OJ)$ is equal to $(OI + OJ)$ or **IJ**.
- Hence, $(OC^{**2} - OD^{**2}) / GH = (OE^{**2} - OF^{**2}) / IJ$
- **OC** and **OD** are measured in opposite direction with reference to **O**.
- Hence $(OC^{**2} - OD^{**2})$ is equal to $(OC^{**2} + OD^{**2})$.
- **OE** and **OF** are measured in opposite direction with reference to **O**.
- Hence $(OE^{**2} - OF^{**2})$ is equal to $(OE^{**2} + OF^{**2})$.

If both circles to have a common centre as per (11) and (12) above, then **O1** and **O2** coincide with **O**.

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Then **OC = R1**, **OD = R1**, the Radius of the Endogenous Circle, and **OE = R2**, **OF = R2**, the Radius of the Exogenous Circle. Hence,

$$[(R1)^{**2} + (R1)^{**2}] / GH = [(R2)^{**2} + (R2)^{**2}] / IJ$$

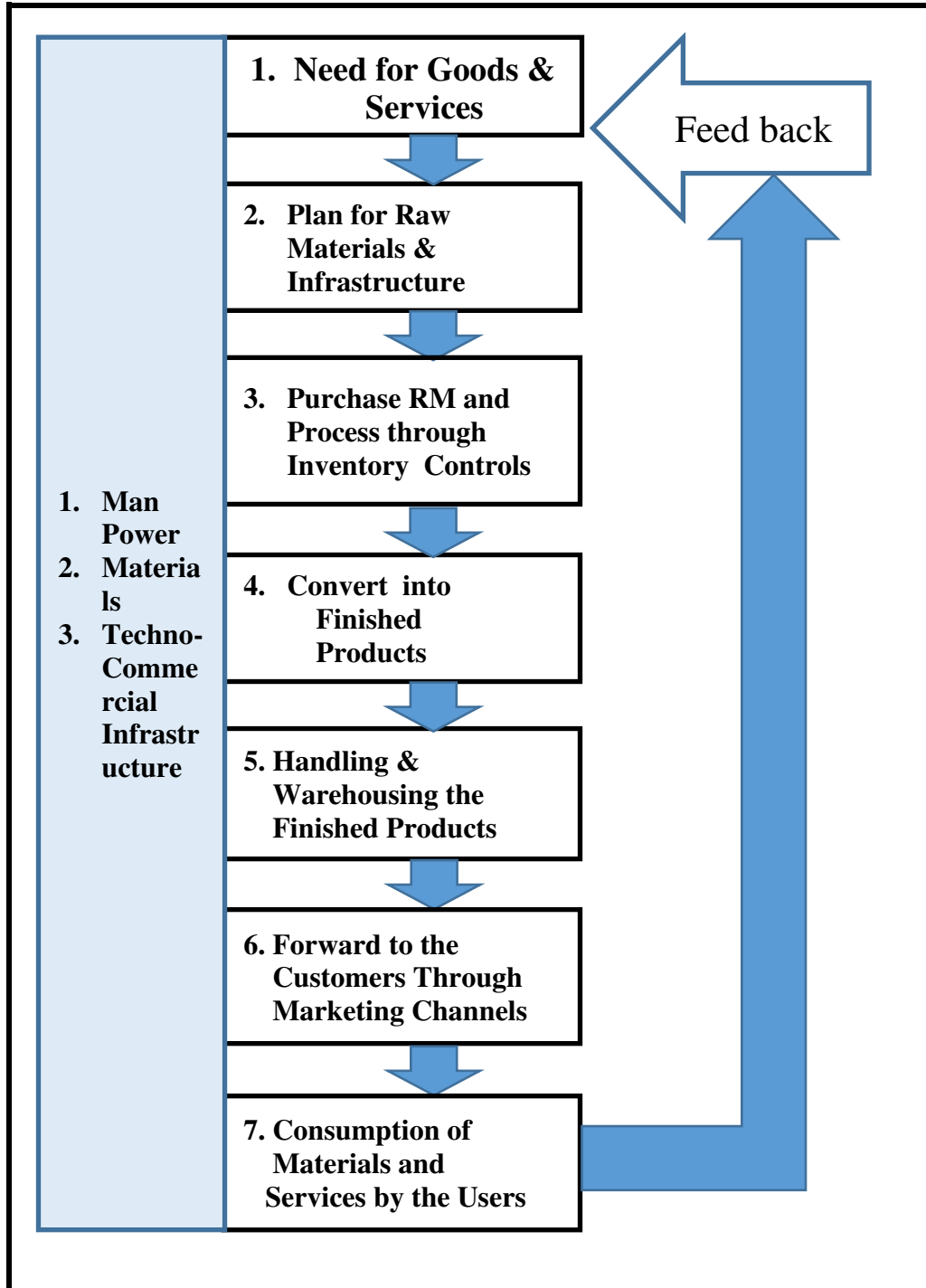
If both circles should have the same radius, then **R1 = R2 = R**, where R is their common Radius. Hence,

$$2 (R)^{**2} / GH = 2 (R)^{**2} / IJ \quad \text{Or} \quad GH = IJ$$

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

ABBREVIATIONS USED		
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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CHART 01. CLOSED CYCLE ECONOMICS



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CHART- 02. BASIC NEEDS OF PEOPLE IN ALL THE NATIONS



A. FOOD - EATING MATERIALS + WATER +MILK



B. CLOTHING FOR ALL MEMBERS OF THE FAMILY



C) A HOME TO LIVE (SHELTER)

CHART-03. HOUSE HOLD SURVIVAL ARITHMETIC

HOUSE HOLD = From Top to Lowest Wage Earners (Labour Class)

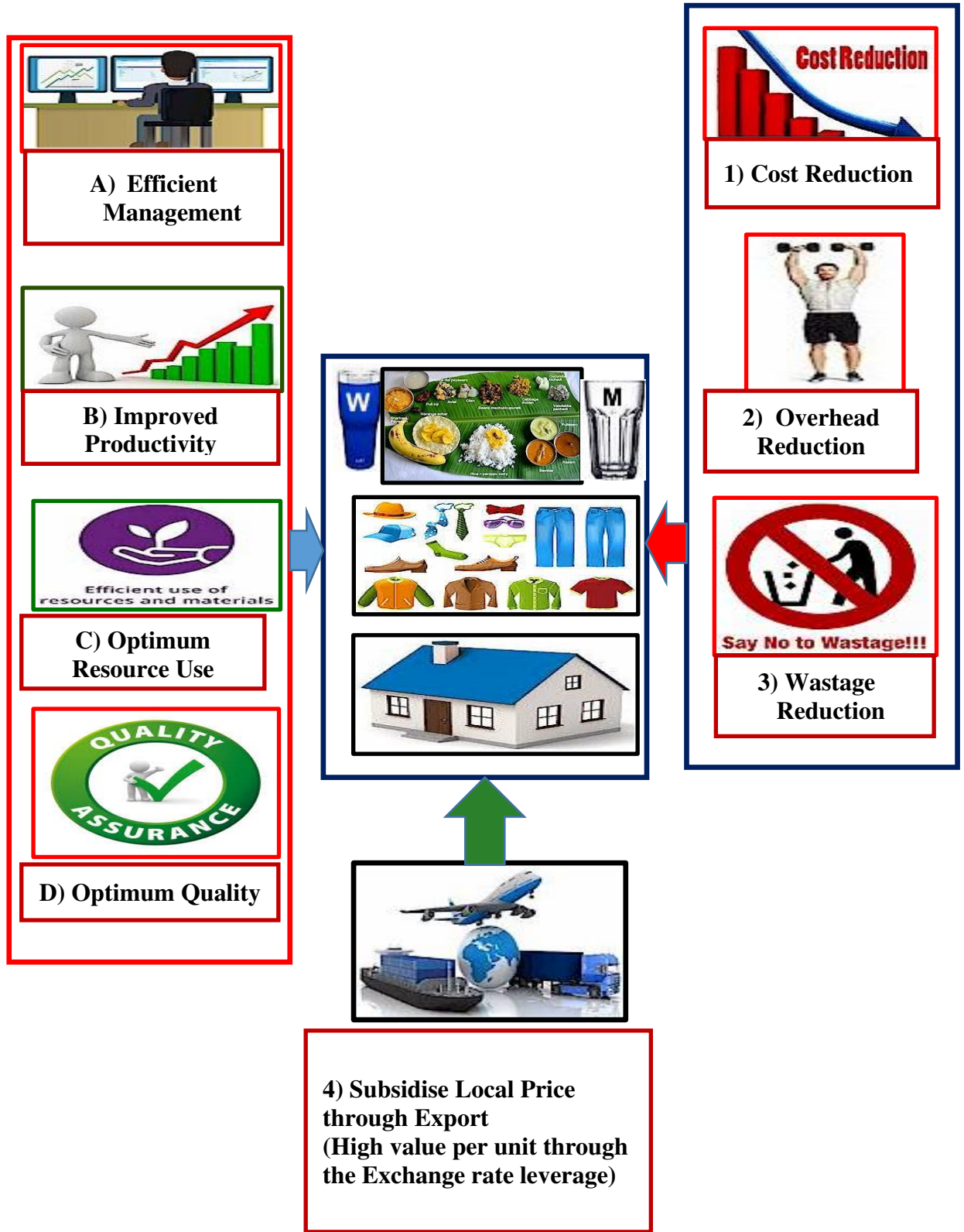
**INCOME PER MONTH OF
HOUSEHOLD (I)**



COST OF BASIC NEEDS PER MONTH (E)

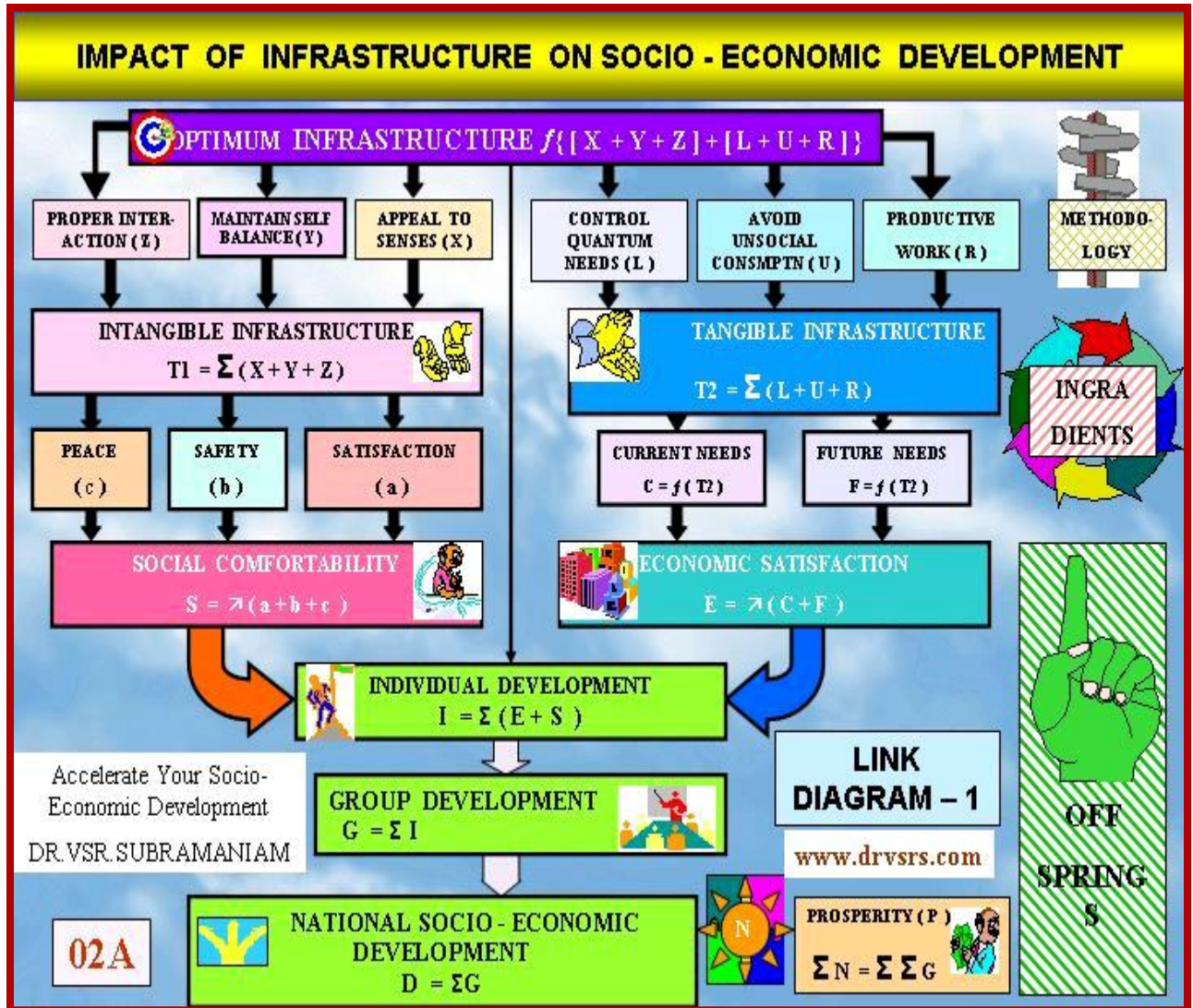
<p>$I > E = \text{SAVING}$</p>	<p>$I = E \text{ or } < E$ NO SAVING</p>	<p>BASIC NEEDS NOT AVAILABLE</p>
<p>DEVELOPED</p>	<p>DEVELOPING</p>	<p>UNDER DEVELOPED</p>
<p>USA</p>	<p>INDIA</p>	<p>BANGLA DESH</p>

CHART-04. MANDATORY ACTIONS ON BASIC NEEDS



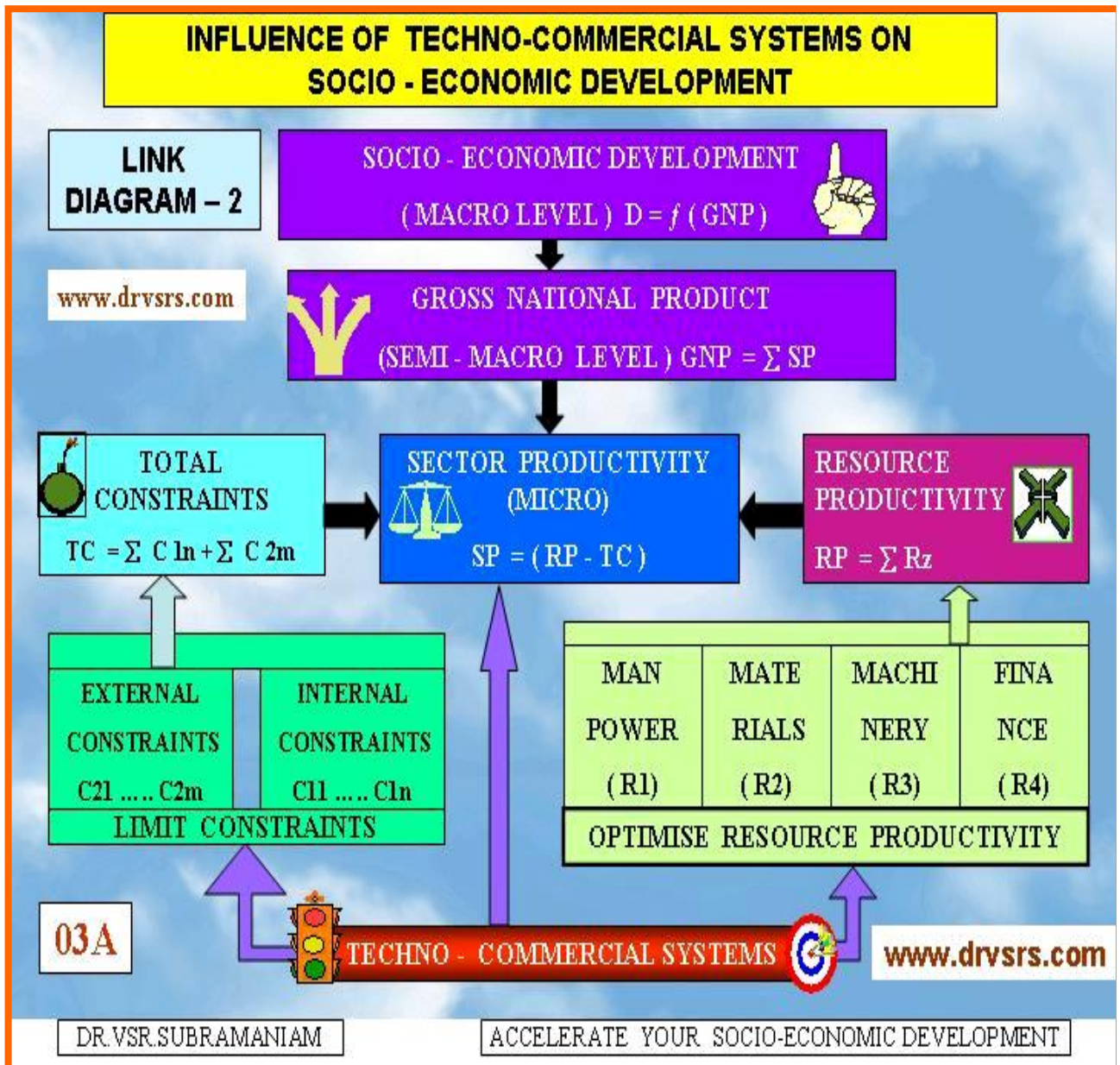
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LINK DIAGRAM – 01



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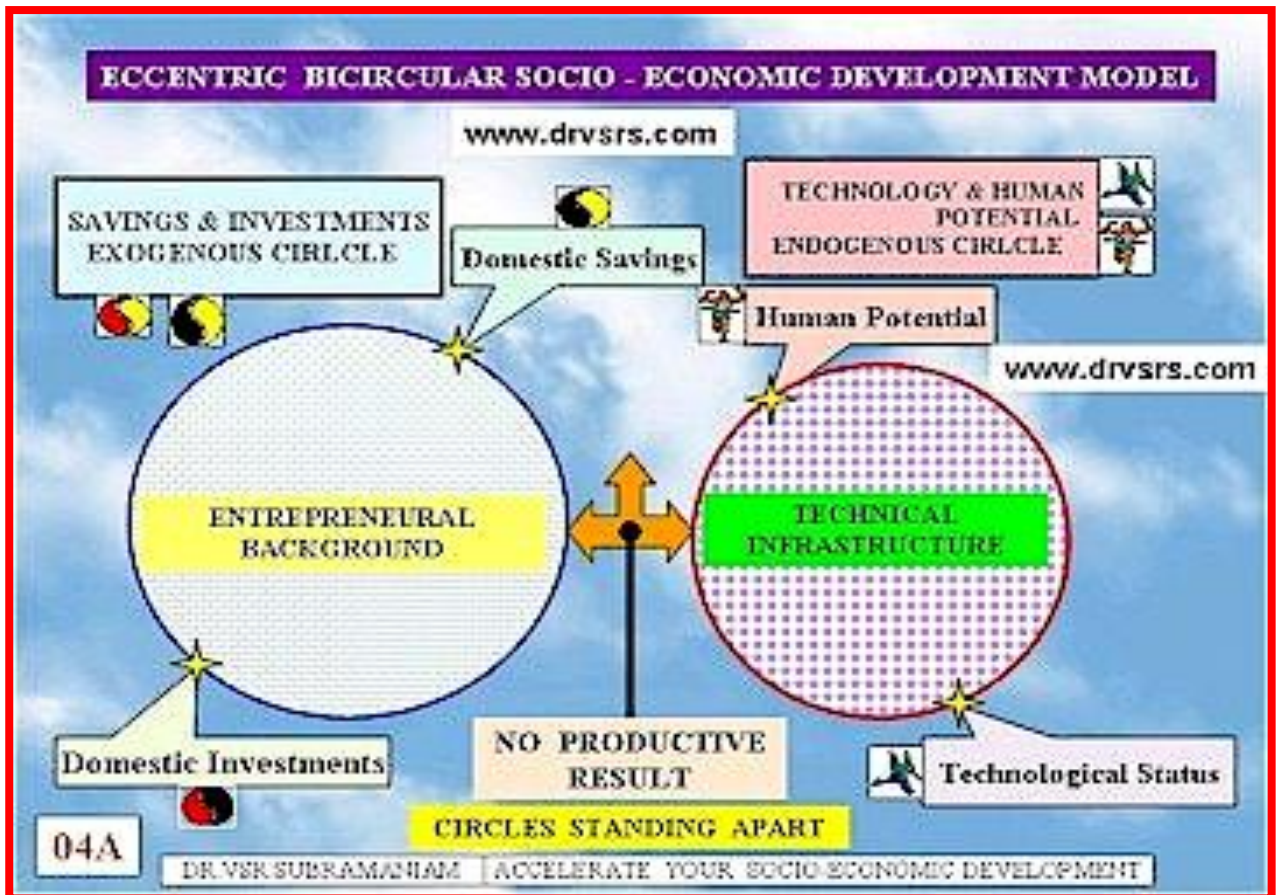
LINK DIAGRAM – 02



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LINK DIAGRAM – 03A

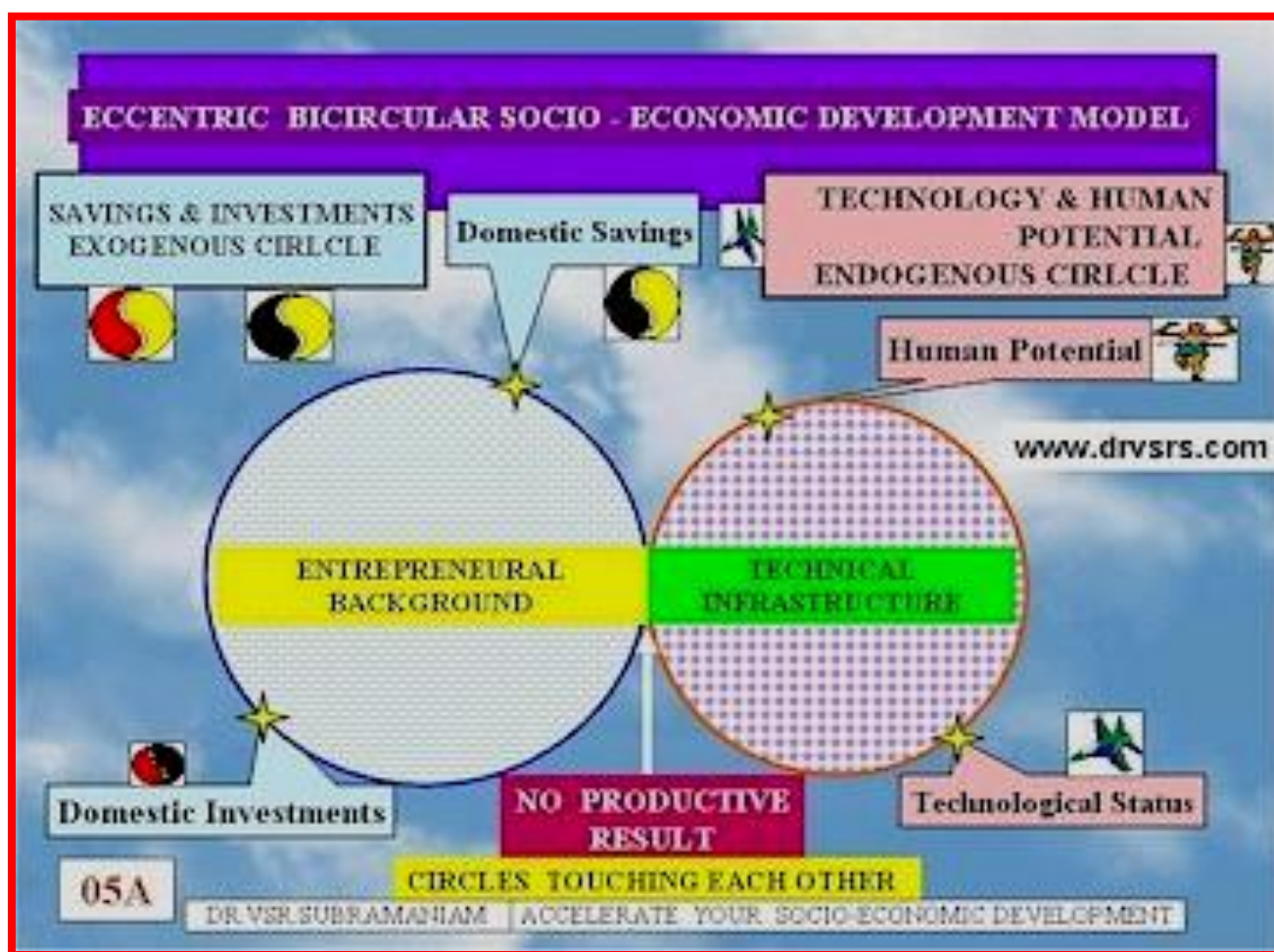
DEVELOPMENT CIRCLES APART



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LINK DIAGRAM – 03B

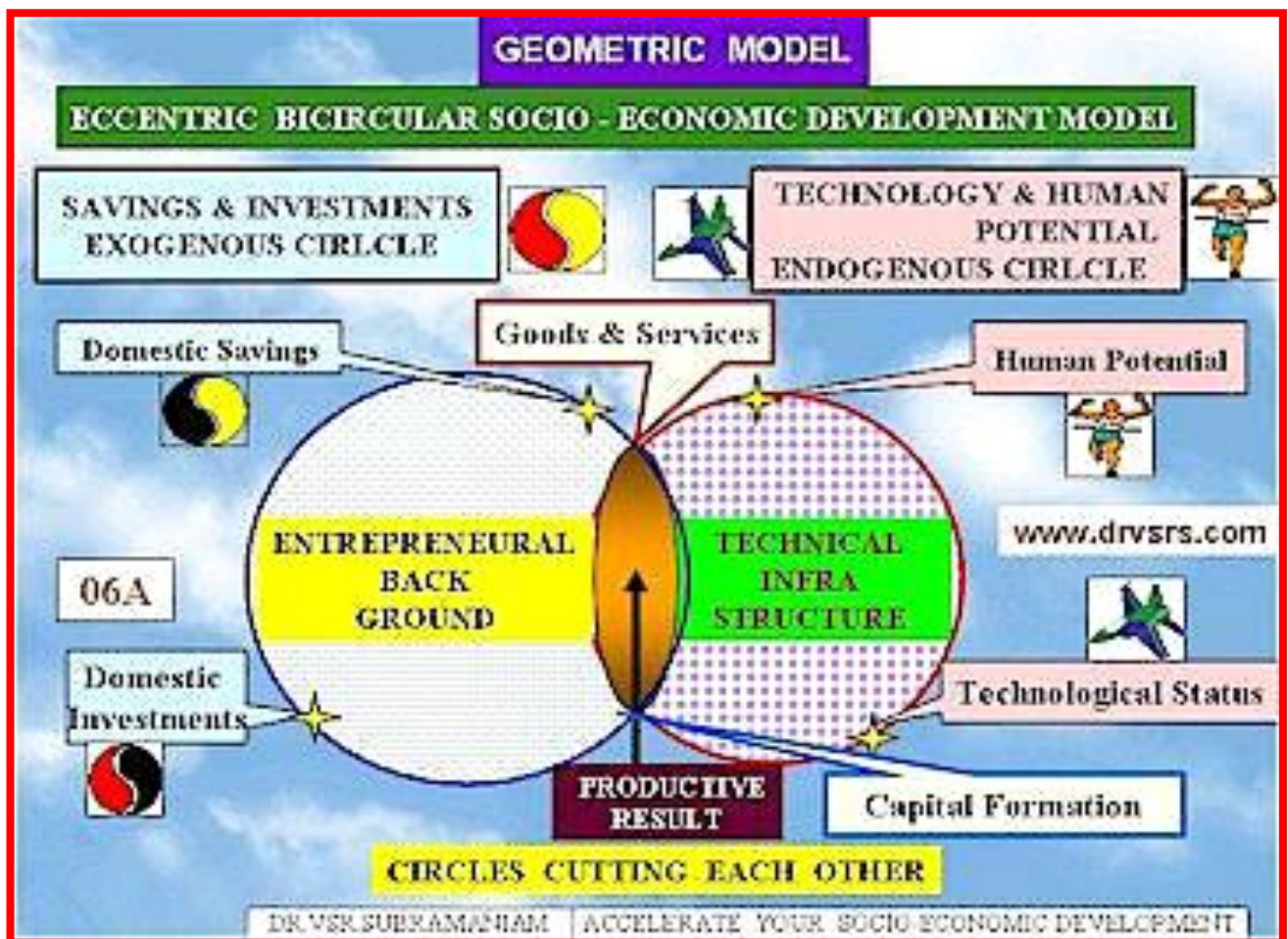
DEVELOPMENT CIRCLES TOUCHING EACH OTHER



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LINK DIAGRAM – 03C

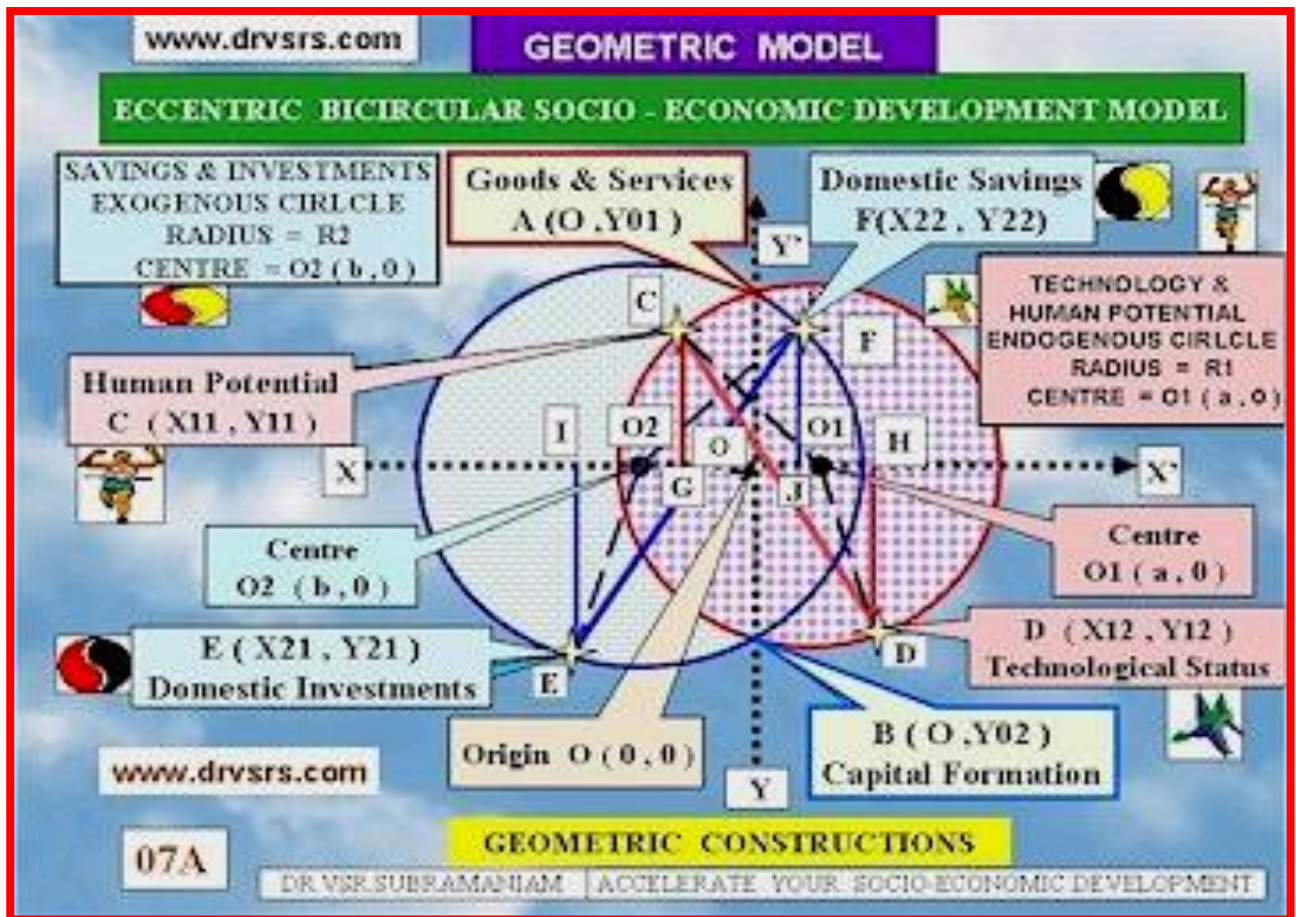
DEVELOPMENT CIRCLES CUTTING EACH OTHER



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LINK DIAGRAM – 04

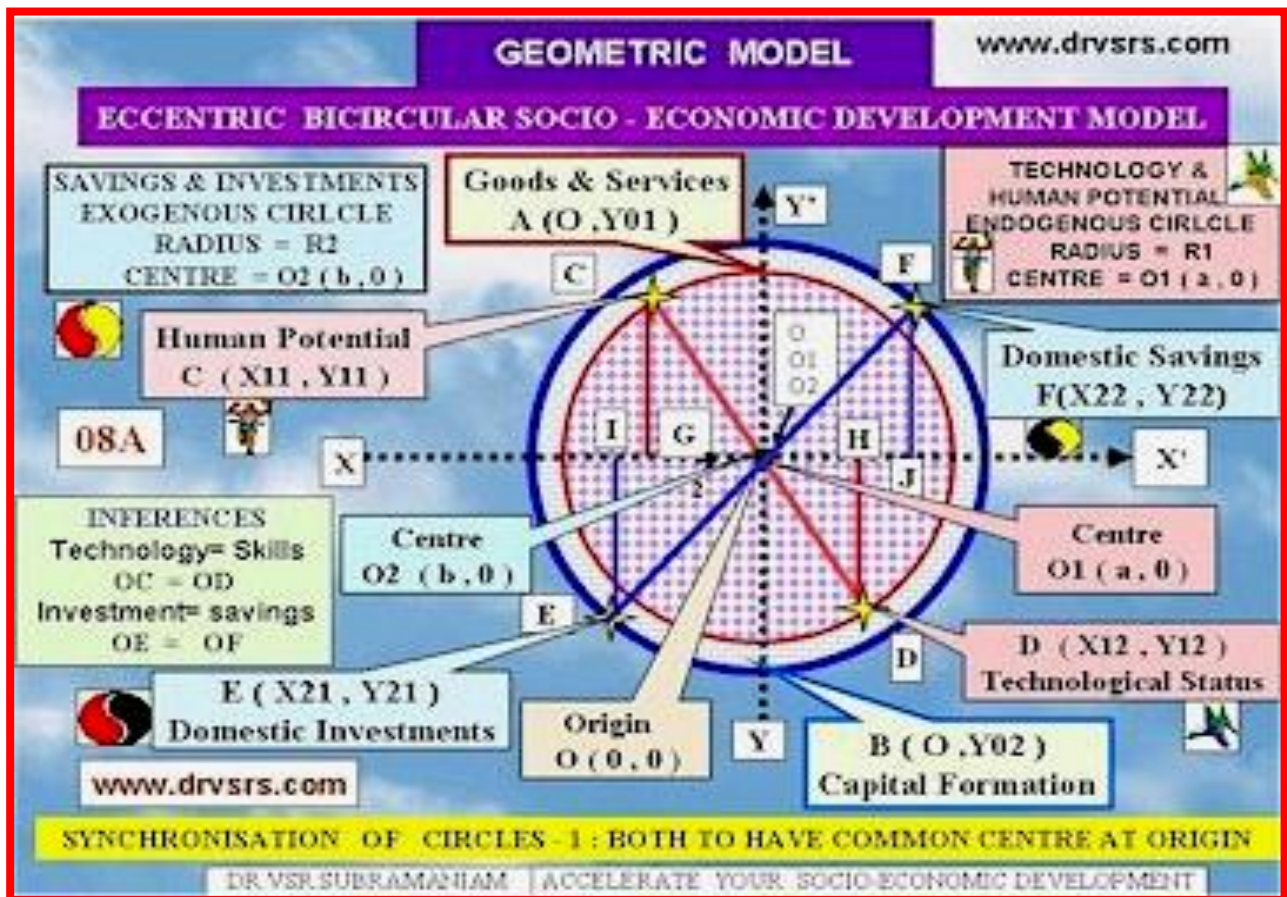
GEOMETRIC CONSTRUCTION ON DEVELOPMENT CIRCLES



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LINK DIAGRAM – 05A

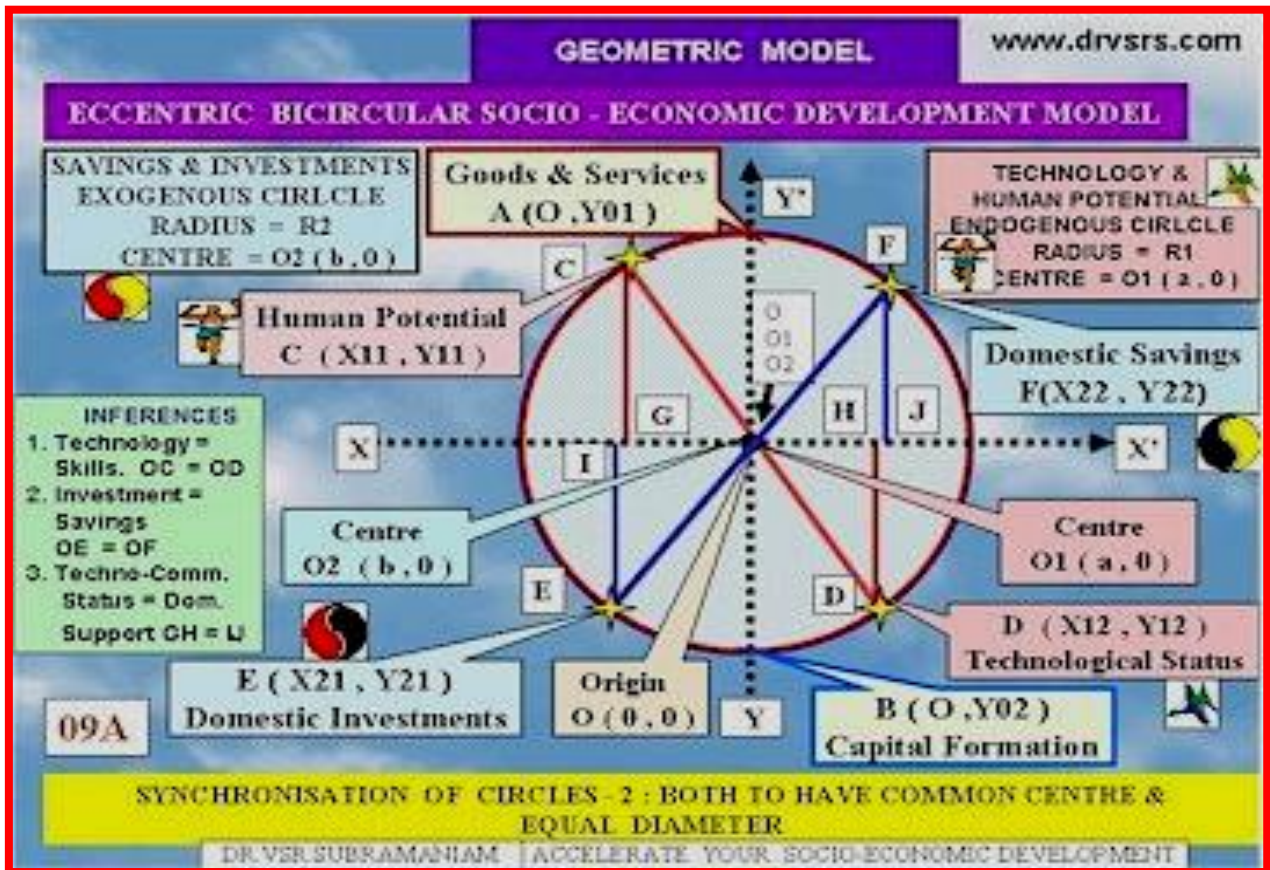
DEVELOPMENT CIRCLES WITH COMMON ORIGIN



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LINK DIAGRAM – 05B

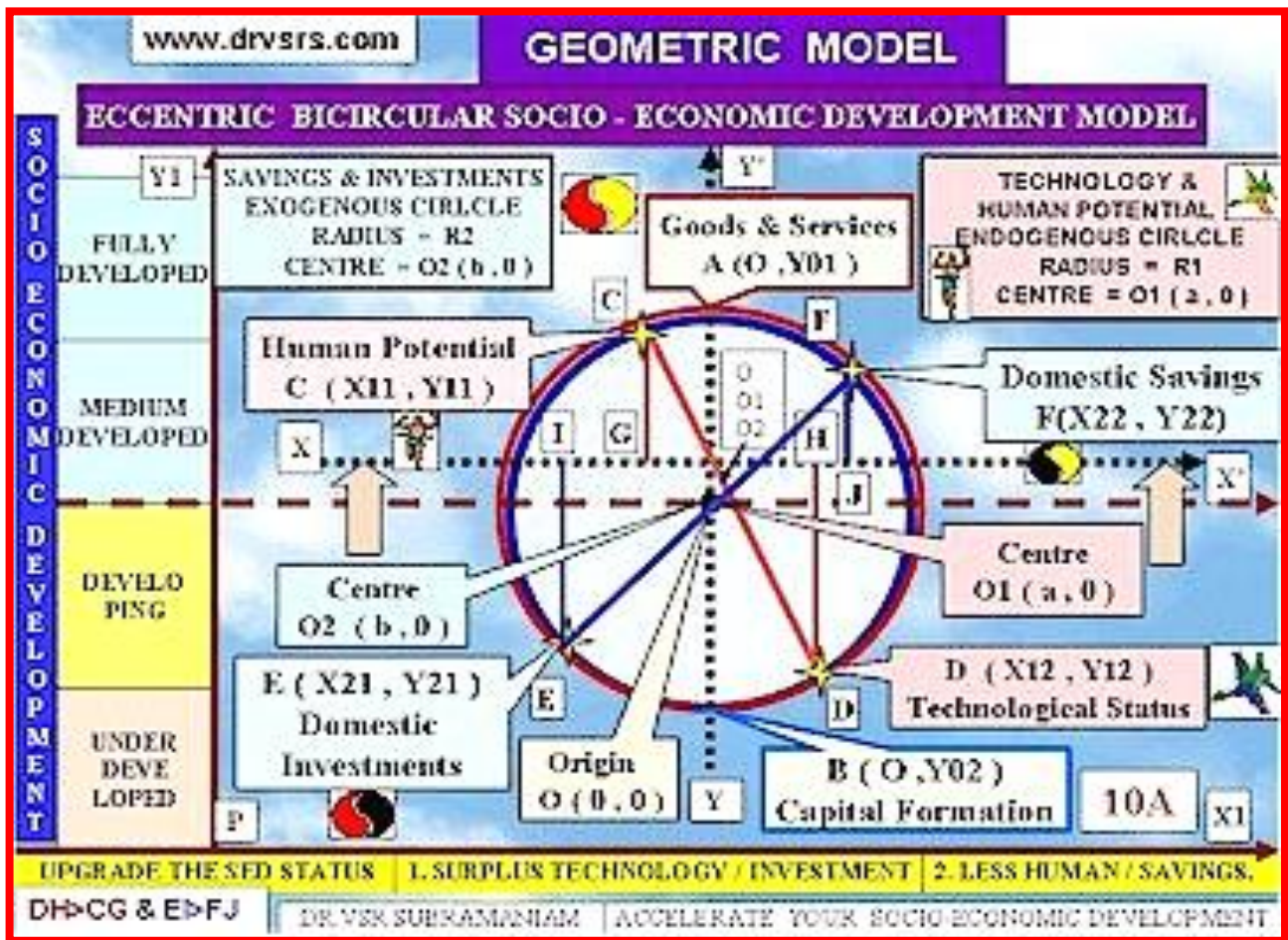
DEVELOPMENT CIRCLES WITH COMMON ORIGIN & EQUAL RADII



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LINK DIAGRAM – 06A

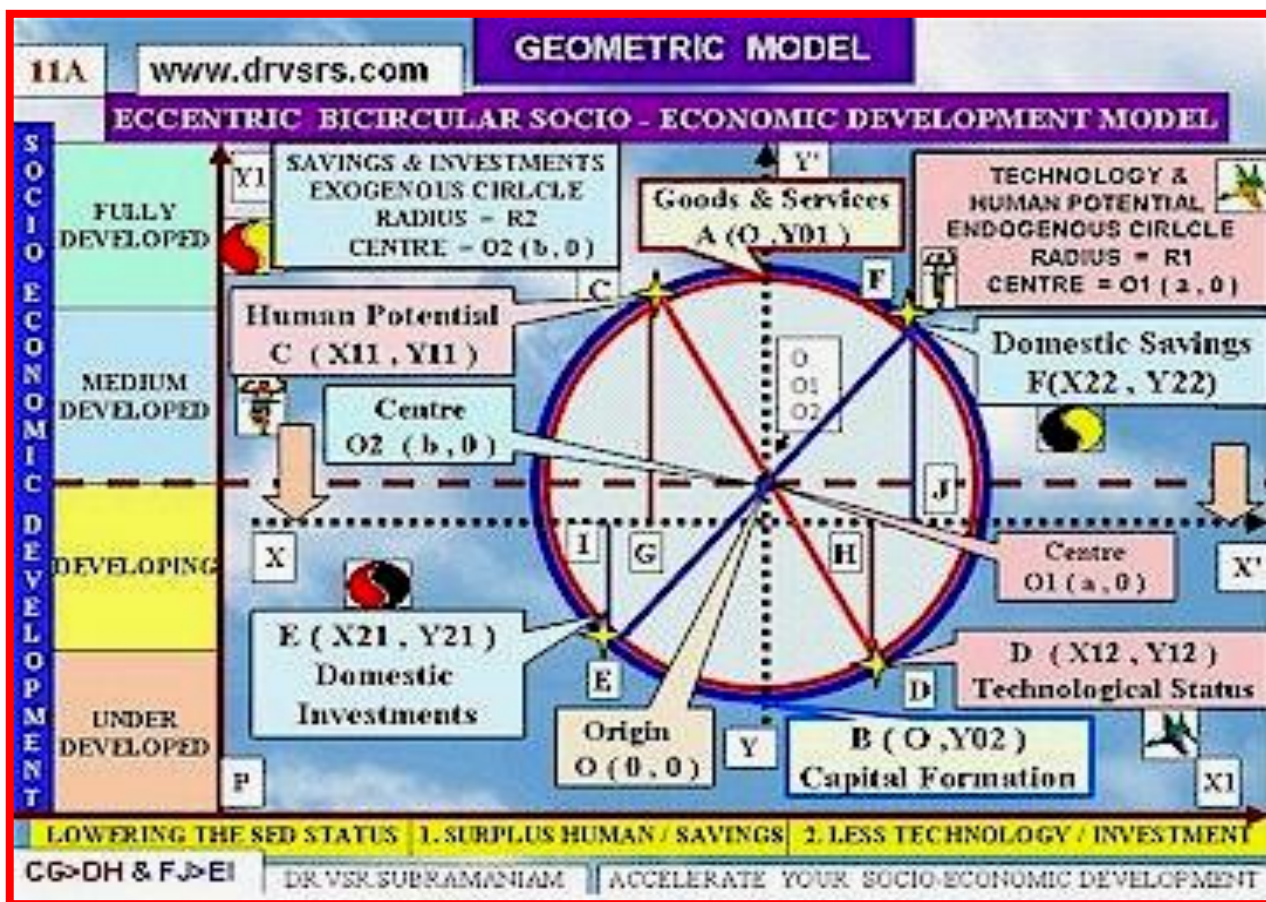
DEVELOPMENT UPGRADE (PUSH UP X – AXIS)



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LINK DIAGRAM – 06B

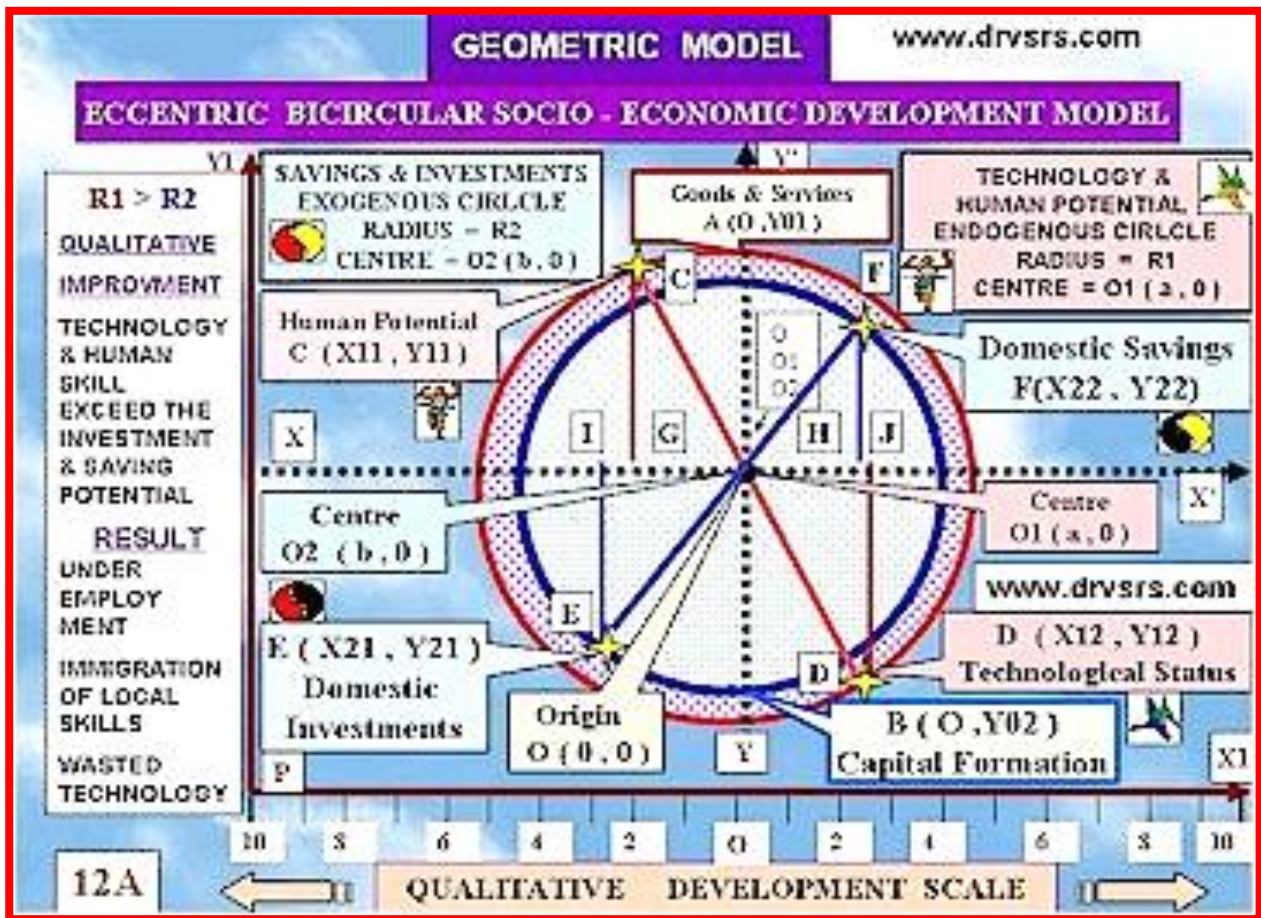
DEVELOPMENT DOWNGRADE (PUSH DOWN X – AXIS)



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LINK DIAGRAM – 07A

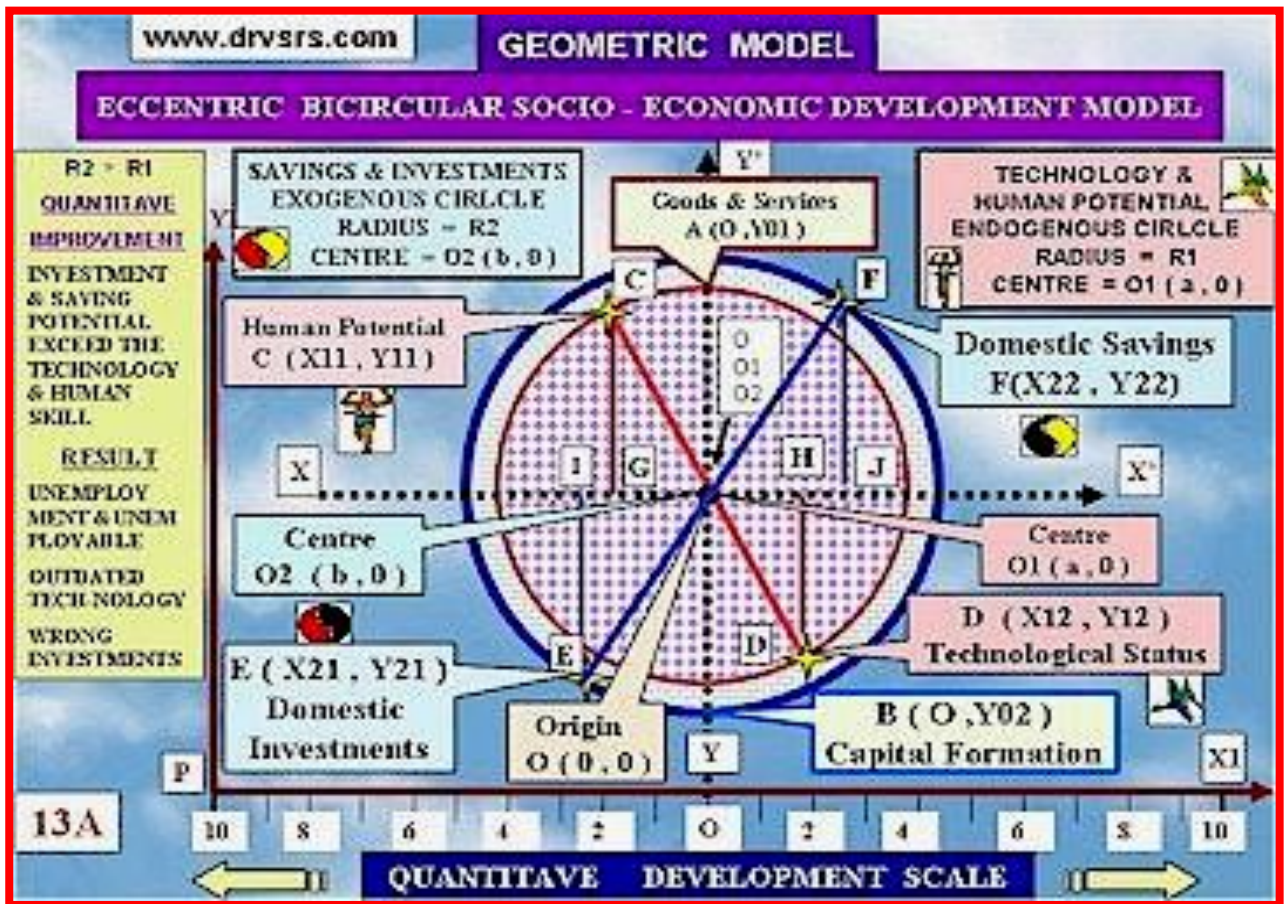
QUALITATIVE IMPROVEMENT IN DEVELOPMENT (INCREASE RADIUS - R1 OF ENDOGENOUS CIRCLE)



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LINK DIAGRAM – 07B

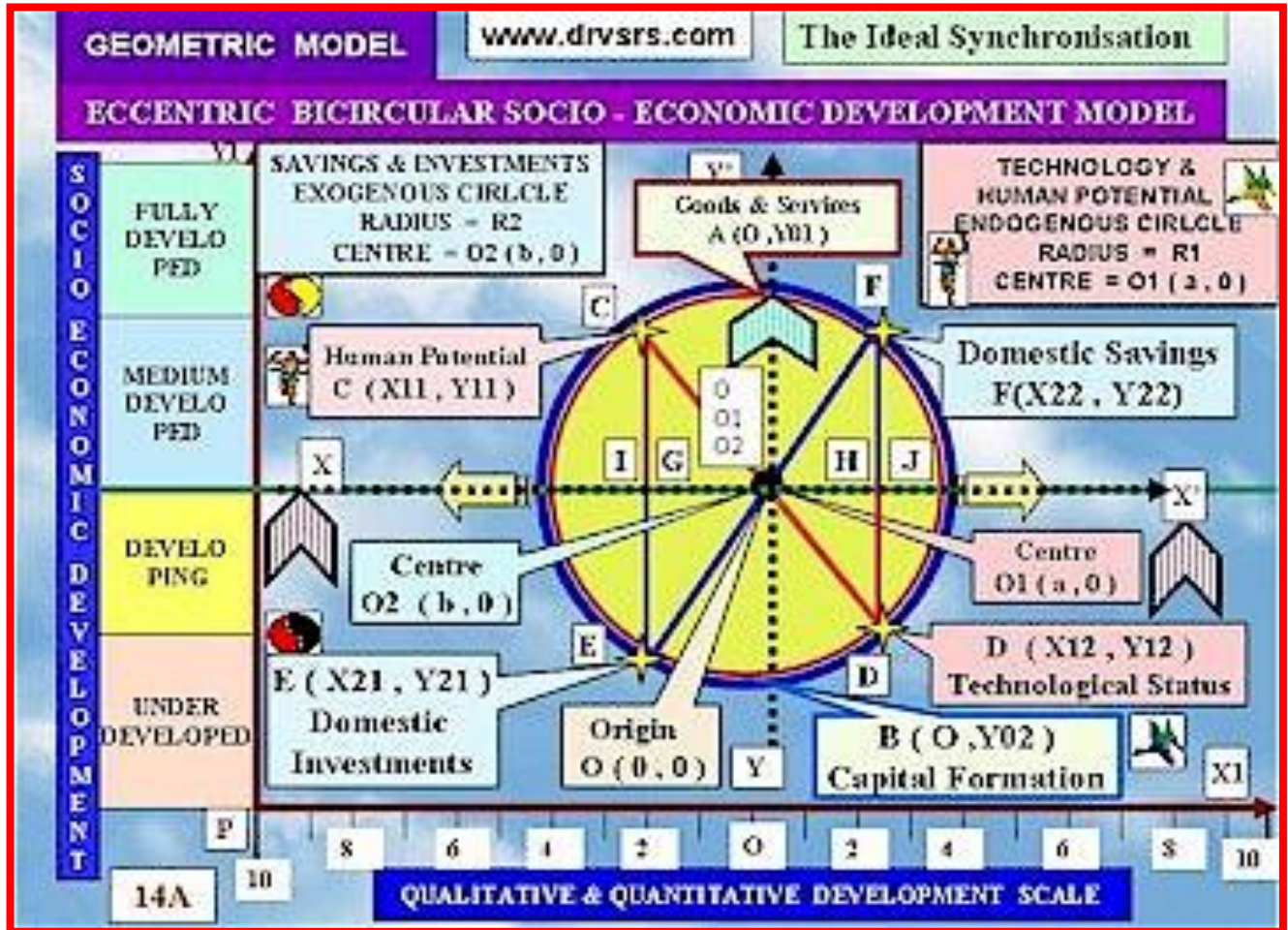
QUANTITATIVE IMPROVEMENT IN DEVELOPMENT (INCREASE RADIUS – R2 OF EXOGENOUS CIRCLE)



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LINK DIAGRAM – 08

IDEAL SYNCHRONISATION OF DEVELOPMENT CIRCLES (EXPAND BOTH RADII EQUALLY)



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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, Woodrow Wilson School of Public and International Affairs, Princeton University, New Jersey. USA.

Former President of the Caribbean Development Bank (World Bank / UNDP Set-up). Barbados, West Indies.

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Resource Optimisation	- 8	Research & Development	- 4
Training Management	- 2		

SPECIAL NOTE

<p style="text-align: center;">1 2 3</p> 	
<p style="text-align: center;">CREATIVE CONFERENCE</p> <p>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</p>	<p style="text-align: center;">ACCREDITED ASSOCIATION</p> <p>DR.VSRS WITH ARTHUR LEWIS Nobel Laureate in Economic Science 1979 In the University of West Indies, Barbados Campus. 1982 – 1989.</p>

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Over 50 years of experience in national and multinational organisations as a Head of Techno-commercial departments. Between 1982 and 1989, was associated with 5 Nobel Laureates in Economic Science. Created & published new models to accelerate the Socio-Economic Development, by unique application of Algebra and Geometry to the area of Economic Science.

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