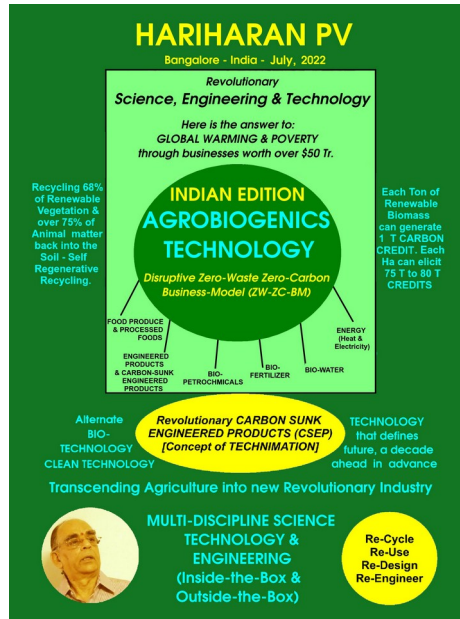




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## EXCERPTS FROM THE BOOK “AGROBIOGENICS TECHNOLOGY”



## 0-2: Short History, instead of Prologue Science, Technology and Engineering

*Science and Scientific Method are supreme in human knowledge*  
[NOTE: PVH in these writings pertains to HARIHARAN PV]

***PVH** learned very early (while at High school level – 9<sup>th</sup> and 10<sup>th</sup> standard levels – in one of India’s Military Schools, named SAINIK SCHOOL – 1962-66) that **SCIENCE** alone is universal; Religion, History, Astrology, Technology, Art, Language, Culture and the like, were local/ ethnocentric and geographical. We would define Science as follows: **SCIENCE is a confinement of human thoughts and actions – a platform/ domain – wherein more of the hidden potentialities and phenomena in nature are***



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*unraveled through their effects on all of our senses, and through the resultant creative and imaginative values of sense of perception, transcending beyond earth into space (almost across the whole universe). Science differs from all other knowledge systems on three counts: (1) Any Scientific phenomenon must be reproducible everywhere, including in space/ moon/ planets; (2) Measuring a phenomenon/ concept, through appropriately defined and constructed Yardstick, which should show same results, uniformly everywhere/ universally; (3) A phenomenon/ concept may not be permanently conceived and understood in the same way, in that as observational inferences and measured results change, the “old” concept would be modified/ discarded as per the new evidences/ measurements – giving place to the new/ modified understanding. Science, thus, does not accept anything, dogmatically – and forms an evolutionary knowledge system.*

***TECHNOLOGY** is an art, working on the basis of Science and Scientific Methods, transforming an idea/ visualization into a Design/ Process/ System, forming a “recipe” that could be a general Model, capable of being extrapolated in scale – but Local needs would be prime consideration.*

***ENGINEERING** is the Art and Science of solving the problems involved in meeting the material demands of the society, utilizing the available technologies and utilizing available resources, converted to Energy, Engineered products and various utilitarian goods and systems.*

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## **0-2-1: The Beginning – short history**

About fifty years back (1971), soon after completing Engineering education at Rourkela city, in Odisha State of India, PVH chanced to butt into a huge crowd, blocking the road and seen all across in surrounding spaces. The crowd was “watching” the then Indian Prime Minister, (Late) Ms Indira Gandhi, delivering a public speech. PVH too



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started attentively hearing the speech. The major imports that caught attention were:-

1. India is losing many bright youngsters, who shifted to USA/ UK and other developed nations, leaving India to continue as poor. We need their services, as they are our future.

2. India is under-developed because Indian Scientists, Engineers, Medical practitioners – and other such professionals – are not working on challenging Research and Developments; instead, being satisfied with ordinary Govt jobs. We need to create products and technologies that can compete internationally.

That “speech” changed the mind and “history” of PVH. A plan to shift to the USA, where EI DuPont Co had invited, was shelved. PVH took a **personal oath**: *Shall never shift to any other nation, even if one had to struggle with very low income and live in extreme conditions; instead, would work and try hard to develop Solutions to various problems that needed Technology developments, here, in India.* Thus, began a long and tough journey, and on the way there was an additional fillip and “spirit” that buoyed up PVH – after reading a concise book on Economic Development:

-----  
“Advanced western technology ... is by no means ideally suited to the typical under-developed country ... Ideally, the under-developed countries would employ neither the western technology of a century ago (which is defective) nor the most modern western technology (which is adopted to a different economics context), but a **third** technology which consists of an adaptation of modern methods to the special conditions of the under-developed world ... but, such a technology does not exist ...” ----- Dr. Richard T. Gill: “ECONOMIC DEVELOPMENT – Past and Present” © 1967, Prentice Hall Inc. USA. (Presented, earlier, under **DEDICATION**)  
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Dr. Richard T Gill’s concept of **third technology** became an obsession with PVH, and it took almost three decades of concentrated observations, study, understanding, experimentation, commercial interactions and many designs, with refinements, before finally arriving on AGROBIOGENICS Technology (ABT). ABT is a “life-time” work, exclusively being undertaken by PVH, and would continually evolve, redefining existing concepts and refining ground works, in tune with needs and situations.

Although the “feeling” for creating nationally needed Technology and Engineering Problem-Solutions was uppermost in the mind of PVH from 1971, the true beginning that finally led to the subject of AGROBIOGENICS had its foundation in a chance meeting with a few distressed farmers – in a small South Indian Town, named Mettur, in Tamil Nadu State. That was in 1991 – almost twenty years after the Indira Gandhi speech that was momentous, in the life of PVH. That first-time interactions with down-to-earth farmers created an initial sadness and sympathy toward the farmers, and paved the way toward working on a “break-through” of understanding a fact: Indian farmers, who supply all the food needs of over a billion people (today’s population @ 1,385 Mn, December 2021), are struggling, without being able to make both ends meet, in spite of over 350 Mn T annual food-grains/ cereals production and corresponding volumes of vegetables, fruits, flowers, herbals and more. It was decided to work on this problem, independent of all Institutions, and other Private R&D and International Agricultural Technology arrangements. That needed almost complete devotion on the subject, diverting attention on the same, full time. PVH had to close down a self-owned manufacturing unit, where Plastics, Polymers, Mold Engineering and Products developments were on, with almost 200 staff and workers. That was a first sacrifice. Thereafter, began engaging with farm/ village communities/ regions all over India: Pathankhot near Kashmir in the north to Kanyakumari at southern tip; Rajkot in the western tip to



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Dibrugarh in the eastern tip; Dhule in north-west to Nelloor in south-east; Mangalore in south-west to Paradeep in North-east – and many places in between, over a period from 1991 till 2010 – interacting in over 1,000 farm/ village regions.

**The essential observations and inferences that laid the main foundation for the subject of AGROBIOGENICS are the following (Indian scenario):**

1. Every farmer/ village community member generates **Biomass**, in the form of **Renewable Vegetation Resources (RVR)**. (Here we are not looking at animal products, including poultry and milk, for the time being – although all of these would also be considered within the totality of AGROBIOGENICS subject).

2. Currently, only the “Produce” (examples: rice, wheat, mangoes, banana, flowers ...) are of value, and a huge mass of **AGROWASTES** (biomass unused, or used for “low value” needs, including as fodder in some cases) do not earn any significant values. Often the weight percentage (as freshly cut in green stage) of such agrowastes could be as high as 90% of total biomass generation.

3. Over 90% of the farm community are extremely small farmers, owning less than two Ha lands – many having almost nil lands.

4. The said small farmers (almost 45% to 50% in them being farm labor force, since they have no landholdings – many having lost their lands to usurers, by way of redeeming debts) are under great strain and struggle.

5. Govt arrangements, although officially offering various subsidies and technological services (in terms of subsidized seeds/ water/ electricity; zero-tax; subsidized fertilizer, **Minimum Support Price – MSP** – guarantee and low interest loans), are inefficient due to various deficiencies in implementation – almost nothing reaching or helping the small farmer community, as were originally intended.



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6. It is estimated that India has 160 million Ha arable lands, in which about 90 Mn Ha have irrigation; the balance 70 Mn ha have no irrigation, and depend on sparse rains, and with almost nil value-farming. Many **Bottom of Pyramid (BoP)** farmers are forced to sell off their small lands to real Estate builders, resulting in loss of farmlands for agriculture.

## 0-2-2: A brief Look at Latest Farmer situation in India (December 2021)







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1. There are about 200 million **Farm Families (FF)** in India, spread across. 160 million Ha – spanning within a total Indian land area of 3.287 Mn Sq KM, and spread in about 635,000 villages.
2. The Market values of all farm produce (food-grains, vegetables, fruits, oils seeds, flowers, milk, poultry, animals, cotton, and the like) are ₹26 Tr (approximately \$342 Bn – as in March 2022).
3. The ground level “take-home” values in the hands of FF are estimated @ ₹6 Tr (less than \$80 Bn).
4. The per-capita FF take-home earnings would be just about ₹30,000 (\$395) – food needs taken care of, from own farming activities.
5. The estimated **Minimum Decent Level (MDL)** take-home moneys for each FF must be ₹350,000 (\$4,600) – almost twelve times present earnings... a pathetic situation of 200 Mn FF (total 950 Mn people, including family members).

## What is the Answer?

Farmer problems are excellent opportunities for disruptive Technology development that can create high value additions, using the huge biomass/ agrowastes that are available to an extent of close to 10 billion Tons in India. These are non-forest RVR, and over 90% of those are currently wasted.

**The technology and operational systems formulated, devised and designed under ABT, would form answers to farmer problems** – and the resultant **Productivity/ Efficiency/ Profitability (PEP)** involved would be high enough to create conditions for at least three-fold increase in farmer earnings (with immediate effect), without any additional modifications and investments to be carried out by any farmer. The industrial set up based on ABT can generate over fifteen to twenty times basic values of the



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biomass generated by farmer community. Here, we may add that the take-home values that could be made available to FF in India, through ABT based manufacturing units set up, could be not less than ₹75 Tr to ₹80 Tr (average \$1 Tr – close to \$4,400 average percapita). At this level, the average earnings would surpass the MDL take-home needed by Indian FF.

**ABT** is not merely the answer to farmer struggles and problems (which were the main causes that this work initially attempted to address); but it **opens up an entire series of operations and processes, resulting in new (Alternative) Materials Engineering, Energy Engineering and Engineered Products Manufacturing systems, touching every engineering subject and almost pervading all walks of human life and needs.**

We recall, here, an earlier statement (0-1-2):

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“ABT would generate partnership-nexus between industry and farming, wherein all of the Agro-Resources and Agrowastes would form base raw-materials for the industry. The resultant operations create conditions for new Bio-Resources based industries, generating (as pointed out) Alternate Energy, Alternate Engineered products, Alternate Bio-Petrochemicals and many more value added products (including processed foods), developing into a new Industrial Revolution. Value additions through Farming operations would improve. Costs of food materials would come down, benefiting all stakeholders – including final consumers”  
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### *End Notes – CHAPTER-0-2*

*This compendium is the first write-up that would introduce the basics of the subjects and concepts involved in ABT – and the different matters are continually undergoing various reformulations, redesigning, re-tests, and would have many more refinements. This book is being named AGROBIOGENICS Technology (1) – there would be (2) and (3), coming up in the next couple of years, wherein the additional modifications, new concepts and designs/ systems would be added on. five parallel connected subjects have also been developed: **AGRO-POLYMER INDUSTRY-COMPLEX (APIX); ZERO-WASTE ZERO-CARBON BUSINESS-MODEL (ZW-ZC-BM); VALUE-FARM MODULE (VFM); TOTAL VILLAGE DEVELOPMENT PROGRAM (TVDP); QUADRUPLE IMPACT DEVELOPMENT (QID) paradigm. Each of these would also be made available in Book form, over the next few years. This book briefly touches on all of these concepts/ subjects.***

*A small group is, currently, being formed into a Company – **AGROBIOGENICS** – that would soon initiate various on-the-ground practical project setting up works – initially in India, to be followed up in over 100 developing nations: in Africa, South/ East/ West Asia, South/ Central America and in various Ocean Island nations – each such nation needing Third Technology – now available in defined and systematic form, in the new name: **AGROBIOGENICS Technology**, beginning with this book publication. Once again we remind the readers that all of these, presented through different Chapters here, would also have full value and practical implementation*



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*possibilities in over 100 Developing Nations – mainly in the Tropics. It is averred that value additions, through ABT, would be the holistic answer to economic development needs in all these nations.*

*A note on **ENGINEER** ... The Engineer's function is to Conceive, Design, Devise, Construct, Operate and Manage the technological and related commercial/ economic aspects of the material demands of the society. To do this he/ she draws on the Laws and Effects of Scientific Concepts/ Principles and Theories; on the experiences and records of earlier engineering-works that he/ she is able to draw on; and on Social conditioning/ values. The extent to which concepts/ theories in science are drawn depends on the extent to which scientists have uncovered facts and established veracity of fundamental principles; the extent to which one can draw on the earlier works depends on education, good commercial practices and systematization of various earlier works–data and inferences; the extent to which social conditioning can help the engineer would depend on society's views and understanding/ acceptances of the engineer's accomplishments. Socioeconomic up-gradation, without environmental degradation– shall be the prime philosophy of the Engineer.*

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The Book is available from AMAZON:

<https://www.amazon.com/AGROBIOGENICS-TECHNOLOGY-DISRUPTIVE-ZERO-CARBON-BUSINESS-MODEL/dp/B09WZ9XSBZ/>

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