

Efficiency in Sustainability - The Efficient Life Styles of Kerala

William M. Alexander
Emeritus Professor of World Food Politics
California Polytechnic State University

The Kerala phenomenon, high life quality, has been called "A Mystery Inside a Riddle Inside an Enigma" [SCIENTIFIC AMERICAN, March 1995]. More particularly, Kerala is an unexplained economic phenomenon -- high life quality measures, including first-world size families, at very low income levels. Within India, Kerala is a small state (3% of 930 million). Yet in a size ranking of the 128 world nations, Kerala is larger than the first 98.

The low ranking of India on quality-of-life measures is consistent with the common economic belief that income and quality of life are tightly linked. Viewed from a western perspective there is little to distinguish Kerala from the rest of India on the criteria of income or history and ethnic heritage. And yet on life-quality measurements, Kerala stands near the first-world median and is very distant from the median of other Indian states. Western academic disciplines following popular economic beliefs have failed to explain this mystery, riddle, and enigma.

To the extent that system dynamics is not ultimately dependent on the western economic paradigm, perhaps systems thinking (and some applications of ecological economics) can unwrap the Kerala enigma. System dynamics has all the limits of a proper science. On the other hand, system dynamics does not ignore the "externalities" proscribed in standard economics. All phenomena should be examined, and, whenever relevant, included. System dynamics as demonstrated by Meadows, et.al., is applied to the whole Earth ecosystem, sometimes called Gaia. Accordingly, this Kerala study has sought a systems solution to the Kerala puzzle. The reality of the Kerala experience may add to our understanding of the human impact on the whole Earth system through the 21st century.

The question we asked of Kerala was: How is the human demand for throughput limited to the throughput available to humans? Throughput available to humans is the sustainable taking of Earth resources and sustainable dumping of human wastes.

In order to place this question into terms which may be estimated and calculated in this study, two throughput benchmarks in human behavior were defined. These benchmarks were designed to avoid the antagonistic relationships between perceived human needs for throughput and human numbers in a finite ecosystem. They may be properly applied to large human societies such as Kerala. Benchmark One is an amount of per capita throughput which allows a society to delay death and extend human life spans. Benchmark Two is a somewhat larger amount of per capita throughput efficiently applied to inspire voluntary reproductive choices leading to zero population growth (defined as a Total Fertility Rate of 2 or less) in any society.

In our next step we asked Kerala two more particular questions:

1. How much is Benchmark Two in measurable throughput terms?
2. How is Benchmark Two applied to inspire voluntary reproductive choices leading to zero population growth?

Benchmark Two is located by measuring the smallest per capita throughput of any society which has achieved a Total Fertility Rate of 2 or less. Until a better example (of a large society with both a Total Fertility Rate of 2 or less and a small per capita throughput) is located, we will apply the throughput per capita of Kerala as Benchmark Two.

Accepting Kerala as embodying Benchmark Two leads us to examine how this small amount of throughput has been applied to inspire voluntary reproductive choices. This system part may be viewed as a holistic efficiency process. That is, the application of the least throughput per capita to produce the desired outcome -- inspire voluntary reproductive choices leading to zero population growth. The small amount of throughput applied in Kerala equals Benchmark Two. Accordingly, Kerala scores 100% efficiency, and lower efficiency scores may be calculated for other societies which also satisfy the criteria, Total Fertility Rate of 2 or less..

Given the forgoing preparation, we are prepared to put the actual question basic to our Kerala studies: Why is Kerala more efficient than India? In common with all efficiency questions, we should seek explanatory variables outside our ratio statement, that is, the application of the least throughput per capita to produce the desired outcome: voluntary reproductive choices leading to zero population growth. In efficiency questions the explanatory variables are information -- that is, how to achieve the desired outcome with the smallest amounts of throughput. In systems terms we think of our desired outcome as the product or summation of throughput and information. We might think of a 1 level throughput plus a 1-level information as producing the Benchmark One we see in India as a whole. And we might think of a 1-level throughput plus a 2 or 3-level information as producing the Earth resource-use efficiency we see in Kerala.

Structures within societies control information flows. And in systems thinking, changing structures means changing the information links and flows, that is, increasing both the quality and the quantity of the information applied. The links in information systems, control the content and timeliness of the data that systems actors may work with, that is, the goals, the incentives, the costs, and the feedbacks that motivate or constrain behavior. The same combination of people, institutions, and physical structures can behave differently when its actors see good reason for doing so in conditions of freedom to negotiate change. Over time, a system with a new information structure can socially and physically transform itself. It can develop new institutions, new rules, and people trained for new functions. All of these things have happened (in various degrees) in India during the past century. We find that such events happened more frequently and more profoundly in Kerala than elsewhere in India.

The most dramatic structural characteristics relevant to the information links and flows in the India-versus-Kerala comparison are hierarchical and lateral communications. Almost all observers of Indian society have noted the pervasive structuring sanctified in Hindu religious tradition, and labeled "caste". Caste is an unusually rigid structural system based on birth, a layer upon layer of humans in

hierarchical order. Information (which flows laterally within castes) has been strictly regulated at the links between castes by hierarchical rules, promulgated and taught for two millennia by the highest caste, the Brahman priests.

Describing information outside of the special case of Indian caste, systems experts [D. Meadows, D. Meadows, and J. Randers, *Beyond the Limits*, 1992] explain, "Pervasive changes unfold spontaneously from new information structures. No one need engage in sacrifice or in strong arming, except perhaps to get some people to stop deliberately confusing or distorting or ignoring information. Human history is full of structural transformations, . . .

"The structural causes over which people have the most power . . . are the social norms, goals, incentives, and costs that cause people to want more than a replacement number of children. They are cultural expectations and practices that maldistribute income and wealth, that make people see themselves primarily as consumers and producers, that associate social status with material accumulation and that define human goals in terms of getting *more* rather than having *enough*." [Ibid. p 192]

Returning to the Kerala phenomenon, the 19th century rigid caste structures disintegrated more rapidly and completely within Kerala than in all India. Destroying caste restrictions freed the flow of information; the open system known within castes was achieved throughout the whole of Kerala in the 20th century. Free flowing information was the key to a positive social transformation in Kerala. Larger information flows fostered knowledge about the life-sustaining needs and interests of other humans near and far. Most important was the information quality -- "information flowing in new ways, to new recipients, carrying new content, and suggesting new rules and goals (rules and goals are themselves information)."[Ibid. p 222] The new free-flowing information systems, crossing caste lines, created an open and dynamic information system in Kerala. The information variable has expanded more in Kerala compared to the rest of India.

Systems thinking has allowed us to locate a critical variable -- the free flow of information released by the rapid demise of caste in Kerala -- a variable which can explain why and how Kerala has been more efficient in the creation of high life quality and sustainable family sizes. In addition, our holistic search has located a variable in the cultural heritage of Kerala (not yet studied) with more potential significance than the efficiency explanation.

In that bit of India which was to become Kerala, the census of 1881 revealed a population with a first-world characteristic, more females than males (101 to 100). A census in a much larger part of India (Punjab) in the same period displayed the typical third-world pattern, less females than males (85 to 100). This first-world versus third-world difference continues to be measured a century later -- Kerala 103 to 100 and Punjab 89 to 100. A higher valuing of daughters in Kerala than in all India has persisted for over a century. This hard evidence (connecting higher female status to the high life-quality measures secured in Kerala during the 20th century) begs for careful definition and in depth research.

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