WHAT ARE SUSTAINABLE FORESTS ?

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Introduction

Sustainability has now-a-days become a fashionable word. However, it means different things to different people, depending upon their perspectives. In regard to Sustainable Forests, the information is extremely inadequate; little scientific research support is available as to - What precisely are their parameters? How to quantify them? How to relate them to one another? Sustainability for whom? For Man, Wildlife, Timber production or production on Non-Wood Forest Products? Even the Rio Conference has said little about it. Hence, the temptation to write this article. As the title suggests, what is documented here is largely conceptual and based on the author's observations spanning about 33 years. In any case, I consider it a good beginning to stimulate thinking and provide motivation to write about it. It is only recently that the Clinch Powell Sustainable Development Initiative (CPSDI), a non-profit organisation incorporated in 1995 in U.S.A., as also a few others have undertaken research to ascertain what constitutes 'Sustainable Forests'.

A large number of documents are produced regarding Sustainable Economic Growth, Sustainable Production in manufacturing units, Sustainable Employment generation, Sustainable Supply of raw materials for processing and the like. In a majority of these documents however, Sustainability is treated as synonymous with Sustained Production or Supply over a relatively short period of time. In fact, Sustained Production does not necessarily mean sustainable production; though sustainable production does include Sustained Production. It is relevant and appropriate to mention here that, any resource that is not renewable, cannot be sustainable in the true sense of the word; oil, coal, minerals, inorganic chemicals and the like fall in this category. However, their use and hence their depletion can be minimised through conservation and advanced technology, so that they become sustained for a relatively longer period of time. Unfortunately, a capitalist society based on consumerism which necessarily entails wastage, finds it hard to conserve these finite resources infinitely.

The concept of Sustainable Economic Development was introduced in public debates in 1980 by the World Conservation Strategy. According to this Strategy, basically, sustainability and conservation are considered mutually dependent and reinforcing; the former cannot be achieved without the latter. The World Commission on Environment and Development defined Sustainable Economic Development in its Report *Our Common Future* as : "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs". This is a theoretical definition reflecting a pious hope for the future generations. In reality, none can say with

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certainty that, a particular model of development would ensure benefits for the future because, the time frame is so large and the probability of the unpredictable is so great, that any precise long term forecast is fraught with uncertainties. It has been the experience the world over that, the existing doctrine of development has sacrificed sustainability, harmed the environment and caused poverty. This is so because, only those outputs which are in the market and have a price are considered, "...so, when you destroy the clean environment - through air and water pollution or toxic acids and other harmful substances - this does not come into the existing economic theory" (Hussain, 1996). Let me take a specific example of Forestry of which I can claim intimate knowledge. The concept of Sustained Yield was developed around 1920. However, Sustained Timber Yield was considered to mean Sustainable Forests; it was assumed that the management of forests (considered then, most scientific for the conservation and development of forests) would continue to provide sustained yield of timber for ever. It is now clear that, at best, it was an inadequate and unrealistic concept which was based on only one aspect of Forest Ecosystem, namely, Timber Production. Be that as it may, perhaps, the Forestry Sector was among the first to introduce the notion of Sustainability. Not only that the objective of Sustained Timber Yield was not achieved, but also, the forests became unhealthy and unstable, in the process. (The Sustained Yield management was so pervasive that hardly about 9 million ha, i.e. about 12% remain as of now, as primary forests; for the remaining 66 million ha of forests, the structure and the composition have undergone a radical transformation). The situation in other tropical countries does not appear to be different. Unfortunately, these adverse effects manifested themselves after a long period of time, about 60-70 years or so.

Natural Tropical Forests (for that matter, all forests) represent the handiwork of Mother Nature which has taken millions of years to bring them to the present state. The process is still continuing and will continue in perpetuity. As such, they are more complex and rich than not only we suppose, but also, more complex than we can suppose. They represent the infinite storehouse of knowledge and ideas. As David Brown (1996) wrote "So many of humanity's bright ideas turn out to be nature's old tricks".

This document deals with only the attributes of Sustainable Forests. It does not deal with : How to manage the existing unsustainable and hence unstable forests so as to progressively convert them into less unsustainable forests.

Sustainable Forests

The existing paradigm of Forest Development has made forests unhealthy, unstable and hence, unsustainable; has caused more floods and desertification; has reduced the food and shelter of wildlife and caused extinction of several species; has marginalised and pauperised forest dwellers; has undermined the purification ability of forests to purify air and water; and has adversely affected the marine life; the list would run into several pages.

The Forestry Sector is in a better position to define sustainability because, it is Mother Nature, if left to herself, that ensures sustainability - a climax stable forest. It deals with fundamentally a natural resource which still contains a few areas

which may be considered to be closest to Sustainable Forests. Such areas are : Preservation Plots created by the founding Foresters and, recently created Protected Areas and Man and Biosphere Reserves. They provide the information regarding : What Sustainable Forests should look like? What should be their architecture and composition? What should be the alignment of different species with differing light and soil requirements? How do various life forms co-exist and what is their relationship with one another? What are the plant and animal dynamics? How and why do they change and during what period of time? What is the contribution of each component, howsoever insignificant it may appear, to the health and stability of the ecosystem? There is a large number of such questions, answers for which we do not know yet, but which can be found by a detailed study and analysis of these areas. They represent an open book of Nature whose language is yet to be deciphered completely.

I have come across a few definitions of Sustainable Forests none of which deals with the complex dimensions of a Forest Ecosystem. Sustainable Forest is basically an Ecological concept but at the same time, has an Economic connotation too. A climax Natural Forest which may be called a Normal Forest is very different from a Normal Forest described in Forestry Textbooks. (A Textbook Normal Forest is that in which each Age Gradation or Class occupies an equal area).

Honorable Minister for Forests and Public Enterprises, Orissa had defined Sustainable Forests in these words : "Put simply, sustainable forest management requires that the forest as a resource has to be conserved and all various uses, benefits and functions of that resources are to be sustained". Perhaps, what he meant or implied was that, Sustainable Forests would ensure environmental preservation, contain floods, maintain biodiversity and contain Green House effect. One of the most eminent but little recognized Gandhian Economists Dr. J.C. Kumarappa, termed Sustainability as "Economy of Permanence". Kamla Chowdhury is perhaps one of the few modern social scientists to include equity, ethics and moral concerns in the concept of Sustainability : "Issues of sustainable development of economic growth, of equity, of man's reconnection with nature can only be achieved by including ethical and moral concerns. It is the civil society rather than the State which will act as a vehicle to transformation". Anthony Flaccavento, Director, Clinch Powell Sustainable Development Initiative (CPSDI) has defined sustainable development, thus : "Simply put, it is an evolving process that integrates the culture and economy of people into the broader ecosystem of which people are a part" (Flaccavento, 1996). He, thus, added 'Culture and Community' dimensions to Sustainability.

It is my understanding that, under a given set of Factors of Locality, Sustainable Forests are undisturbed, stable and healthy natural forests in that locality. The more removed they are from such forests, the less sustainable they are (I know many Foresters may not agree with this). Based on this concept, Man-made forests of one/two species are the least sustainable. This brings us to the question of various attributes of Sustainable Forests. These, *inter alia*, include :

1. Complete recycling of nutrients; zero wastage.

2. Regeneration and degeneration balance

out. In other words, harvested forest products equal in quantity to the quantity regenerated, which is the same as increment.

3. All life forms co-exist in a mutually reinforcing relationship. All the diverse interests are held in harmony. Forest dwellers are a part of this harmonious relationship. A Forest Ecosystem comprises, *inter alia*, of the following sub-systems :

   a. Biodiversity
   b. Wildlife
   c. Forest side Communities
   d. Agriculture
   e. Water
   f. Medicines and Pesticides
   g. Food from Forests
   h. Raw materials for several cottage industries
   i. Timber and Fuelwood
   j. Fodder

4. There is an effective population control. The predators and the prey are in balance.

5. There is no over consumption of any resource. Every constituent has its share of resources equitably. Equity is built into Sustainability.

6. There is zero pollution.

7. The soil fertility status is maintained. The microbiological activities on and below the ground surface are optimum so that natural erosion of soil is compensated by new soil formation.

8. Sustainable Forests permit you to "have the cake and eat it too".

9. A Sustainable Forest is a self-perpetuating, self-regulating and self-sustaining machine designed by Mother Nature.

Sustainable Forests ensure quality environment; they prevent and contain floods and droughts; ensure sustained water supply; purify air and water; control pests and diseases thereby minimize the need for poisonous pesticides; maintain, nay, enhance the fertility status of soils by preventing wind and water erosion; by encouraging the activities of microflora and microfauna, the soils are maintained in good health; contain the Green House effect. One of the little recognized benefits is that, the they generate development opportunities and options. In short, the benefits are wide ranging, profound, long lasting and benefiting almost every aspect of our life and livelihood.

According to the CPSDI, the various attributes are :-

(1) It is good for people, enhancing not our economic opportunities, but only our skills and capacity for resourcefulness.

(2) It is first of all, local; that is, rooted in the human and ecological realities of particular eco-regions.

(3) It is ecologically sound, working within three basic principles governing the biosphere - diversity, community and regeneration.

(4) It promotes local self-reliance within the larger concept of the globe, i.e. with respect for those downstream, downwind and downtown effects.

(5) It lasts indefinitely.

The Director has elaborated on some of the attributes mentioned above. Referring to "local" used in (2) above, he has observed, "Sustainability is of course a global concern and many ecological problems transcend the boundaries of bioregion or nation. But, as Wendell Berry has said of the grand environmental problems, 'the large abuses exist within and because of a pattern of small abuses'...A healthy whole cannot comprise unhealthy parts that feed on one another." Regarding (3) above, he has elaborated : "...diversity is the basis of ecological health, adaptability and productivity."

Sustainability is needed, *inter alia*, for :-

1. Increased food production.
2. Development of benign forms of energy.
3. Prevention of desertification and degradation of land.
4. Prevention of over-exploitation of forests and tree growth.
5. Attainment of an acceptable level of health for all life forms.

Structure and Composition of Sustainable Forests

Little has been studied or researched to determine the structure and composition of Sustainable Forests. What Foresters know is about Normal Forests for sustained timber yield. Indian Foresters have used Smythies' Formula to fix yield in Selection Forests. This formula determines the yield on the basis of the entry of next below selection size in the selection size during the Felling Cycle. However, this gives no idea whatsoever about the structure and composition of the crop, nor of the species other than one/two timber species.

Singh and Ambaskar (1994) have tried to extrapolate theoretically, the structure and composition of a Normal all-aged crop on the basis of the distribution of age-classes in a Normal one-aged crop as found in Sample Plots. The underlying assumptions are that, the distribution of age-classes (each girth class will occupy equal area in all-aged crop) and the rate of growth are the same in both these extreme types of forests in the same locality. It is doubtful to what degree these assumptions are valid. Be that as it may, in absence of any other information available regarding all-aged crops, this is perhaps the best that could be done.

The architecture of different canopies and the alignment of different species within each canopy are little known. No explanation is available regarding why a particular species occurring in the immediate vicinity of another species performs better. Perhaps, there exist in nature some unknown phenomena through which the growth is promoted; may be, there is some interaction, underground and above-ground not known so far, which operates to support the growth of such species. After all, the rate of growth is governed by the amount of light and the amount of nutrients including water that are available; perhaps, these are affected by the proximity to certain specific species. I have observed that *Gmelina arborea* when growing in the vicinity of *Acacia nilotica* looked more healthy and grew more vigorously. Similarly, *Eucalyptus* hybrid when grown in lines alternating with Ipil Ipil exhibited better growth. This is happening all the time in a natural all-aged forest. This leads one to believe that in Nature, there seem to be Friendly Trees,

Enemy Trees and Neutral Trees!

Sustainable Forest and Production

It is a fallacy to assume that Man-made Forests are more productive than natural All-aged Forests in the same locality. As far as total production is concerned, natural forests score higher marks, other things being equal, meaning soil, water and nutrients. However, if you consider only timber production of a couple of most marketable timbers with highest per unit value, then, Man-made forests are superior. However, over a long period of time, timber production comes down because of site deterioration, as has happened to Teak in the Dangs forest of Gujarat State. As far as total economics (prospective) is concerned, perhaps, the natural forests win if the myriad of plants found in a natural forest are evaluated and marketed. It is a fact that, the bulk of plants available in a natural forest have medicinal, pesticidal and industrial uses about which we know precious little; almost everyday, new uses are being discovered. In view of the health hazards involved in the extensive use of chemicals, whether fertilizers or pesticides or medicines, the popular trend now is to turn to products of plant origin. Fortunately, Mother Nature has produced plants for every conceivable use by man; the problem, however, is that we do not know yet the uses of the bulk of plants available on this planet.

Natural Forests are multi-layered and multi-species entities. Nature has so designed them that, only that particular kind of architecture and composition in a given locality alone would be able to capture solar energy optimally and that such a design alone, would also be able to tap soil nutrients at different depths optimally, at the same time. The alignment and the positioning of different plant species is such that there is little competition for the same nutrients; nutrient needs are complementary and mutually reinforcing. It is found that in the same canopy level, the different species are found to be widely spaced and have almost the same degree of demand for light or tolerance of shade. Thus, the different species in the same canopy display little competition; on the contrary, they seem to reinforce one another. This is why some plants growing in the neighbourhood of some specific plants actually grow better. It is precisely for these reasons that, natural forests are more productive than man-made forests in which trees compete for light at the same canopy level and soil nutrients at the same depth. It is also precisely for these reasons that, in man-made forests, water and nutrient supplies are required to be augmented from outside.

In a Sustainable Natural Forest, the mode of regeneration is largely natural. The seeds fall on the forest floor, germinate, compete with others as well as among themselves and ultimately, the fittest survive. Whenever there is a canopy opening because of the death or harvesting of mature trees by man, the seedlings start growing vigorously. Such plants are strong and hence most disease resistant. But, these are the species which Nature wants and not what Man wants.

Sustainable Forests generate goods and services optimally and perpetually. Environmental protection in so far as it relates to forests, is also optimum. Floods and droughts are minimal; climatic excesses are contained. Because of the sponge effect, the rate of infiltration as also the water holding capacity of soil are the highest. It is unfortunate that the connection between

water and forests is not recognised. This aspect has gained immense importance considering that water experts have predicted that, water is going to be a critical resource in the world. As it is, Africa, the Middle East and India are already experiencing critical shortages of water. Cherrapunji in the North-East of India which receives the highest amount of rainfall in the country now suffers from water scarcity in summer because of the destruction of forests. Sustainable Forests meet the needs of all the life forms including wildlife, insects, and forest communities; it produces a variety of goods and services needed to support various sub-systems operating within a given ecosystem. Equity and fairness are built into the system; Nature is not partial to any of its constituents. Thus, the productive, protective, social and environmental functions are optimised only in Sustainable Forests. In a Sustainable Forest, all the different Sub-systems of the Forest Ecosystem are in harmony. It must be noted that all the various subsystems of a Forest Ecosystem are not mutually exclusive; they affect one another. Interfere with one and all the rest are affected as it happened in our forests where the focus was on timber production only.

Sustainable Forests and Harvesting

It is estimated that, hardly about one per cent of wood in tropical forests is harvested in an environmentally sustainable way. The present methods which employ heavy machinery and extensive roads to go with it, cause a lot of soil erosion and damage to standing and felled trees. Harvesting, processing and consumption should be such that, they safeguard ecological processes and genetic diversity. It is only under these environmental conditions that natural regeneration would take place. These kinds of operations require a profound change in the methods so far employed. They also require building relationships between wood consumers and producers so that all concerned work in unison in the direction of Sustainability.

Sustainable Forests and Community

It is only a Sustainable Community which can ensure Sustainable Forests; both have to go hand in hand. (This is where we went terribly wrong in our country; we ignored the people and focused on revenue.) A healthier forest will come about only when the economies of our forest-dependent communities are healthy and diversified. The destruction of Tropical Forests is largely due to poverty of the forest dependent communities. This poverty is caused by several factors, one of which is the existence of unsustainable forests which are not in a position to sustain and support dependent communities. Such communities in turn, render forests more unsustainable which leads to more unsustainable communities. Thus, the unending vicious circle goes on.

Forest side communities are very diverse; cultural diversity of these communities and biodiversity of forests they inhabit, are interrelated. We require the knowledge of forest communities to maintain biodiversity; on the other hand, survival of the cultural diversity of forest communities depends on biodiversity. "Culture plus Nature = Sustainability". It is found that nature conservation and sustainable use of natural resources are an integral part of all the cultures and religions. Unfortunately, the influences of market and profit oriented development and the impact of inappropriate science and

technology have come to erode these important ingredients of religion and culture. However, there are still a few remote areas not yet encroached upon by the modern man. I will quote just one example to illustrate this point. In some of the desert villages of Western Rajasthan (India), the practice of deciding on the punishment for cutting trees from common lands is decided by the indigenous institution called the Village Panchayat. In one case, the Panchayat decided that the offender would feed two and a half kilograms of grain to the birds while standing barefoot in the sun. How does one interpret such a sanction? Would modern management principles be able to generate such a meaningful way of communicating social concern? ... communicate to the culprit and the onlookers that, such torture would be the fate of everybody if there were no trees left. But why feed birds and why only so much? Perhaps a message was sought to be conveyed that the trees also provided sanctuary to the birds which brought various seeds and enriched the biodiversity (Anon., 1996).

A question arises : What comes first - Sustainable Forests or Sustainable Communities? To my mind, the answer is : Sustainable Forests simply because Sustainable Forests provide all the basic, nutritional, medicinal, economic, social, spiritual, cultural, entertainment and sporting needs to sustain the forest community. In such a situation, a relationship of mutuality develops in which Forests support the Community and the community in turn, protects and preserves Sustainability of forests; the community harvests only the increment without damaging the ecosystem.

Sustainable Forests generate adequate local employment for the local community. The processing of major wood and non-wood products, if done locally instead of transporting to far off places, would generate adequate employment. Besides, the modern technology can find uses for the large number of non-wood products available in a Sustainable Forest. The modern trend is in favour of plant based products such as medicines, pesticides, dyes, gums, food additives and a host of everyday use commodities and articles. Thus, a Sustainable Forest would be able to sustain the local community in all respects.

The role of indigenous institutions in preserving sustainability of forest ecosystems cannot be overemphasised. Firstly, such institutions have evolved and refined over centuries and as such are the most eminently suited to the local conditions. Secondly, they are independent and maintain long established traditions. Thirdly, they are composed of the local persons who enjoy the trust of the community.

Research

To understand Sustainable Tropical Forests, it is imperative to carry out appropriate research.

The research ideas that come to my mind and expressed in a layman's language, *inter alia*, include :-

1. Interrelationships and the present status of different life forms inhabiting a Forest Ecosystem. This will include forest-dependent communities.

2. Impact of management interventions on the status and relationships of different life forms.

3. Role of each life form in and its contribution to, the maintenance of the ecosystem.

4. Non-Wood Forest Products, their production, harvesting, evaluation, marketing and ultimate consumption; their contribution to the maintenance of the ecosystem.

5. Soil productivity under different management practices.

6. Ecological Reboisement of Wastelands, Degraded Farm and Forest Lands and all kinds of Refractory Lands.

Conclusion

It is difficult to define precisely and comprehensively "What are Sustainable Forests?" at the present stage of our knowledge. This is so because, there are several dimensions some of which are either inadequately understood or not understood at all.

The basic question to be answered is; Sustainable Forests for whom and for what service and/or product? Sustainability is not of trees or jobs, wildlife or forests, forest dwellers or forests. Sustainability is for all these taken together. Sustainability of Forests relates to all things, living and non-living - Water, Air, Mountains, Rivers, Wildlife and Marine life and ultimately to Land. In reality, sustainability has several dimensions such as culture, forest dependent communities, logging, transport, processing, consumption, bio-diversity and the like, all of which have to be integrated. If any one of them is not sustainable, then the forests cannot be sustainable. In a sense, Sustainable Forests mean back to Nature. Learn from Nature before you intervene. (Our interventions so far have been *ad hoc*, unfounded and largely assumptive).

Sustainable Forests is a condition in which every element comprising an ecosystem is in equilibrium; in balance; in harmony with others. Every component satisfies its basic needs. It is a conditions in which the ecosystem perpetuates itself in totality.

The concept of equity is built into the concept of sustainability. Nature is not partial to any component; it supports optimally all the components that comprise a given forest ecosystem.

Wasteful and overuse of resources by man has resulted in loss of sustainability; greed undermines sustainability. In a sense, all of us are contributing to unsustainability through excessive consumption and wastage..

It needs to be recognized that, the concept of Sustainable Forests is entirely compatible with the growing demand for "People-Oriented" development that achieves a wider distribution of benefits to the mankind. It makes fuller use of people's labour, capabilities, motivations and creativity and is more sensitive to their cultural heritage. For Sustainable Forestry, "Small is Beautiful". It has to be locally rooted. Unless each small part is sustainable, the whole cannot be sustainable.

In conclusion, it may be stated that, Sustainability Forests are those which benefit Man and Environment the most. Such forests are ecologically stable. Thus, fundamentally, the needs of Man and the needs of Environment coverage in Sustainable Forests. Since Man is an

integral part of an ecosystem and is the most powerful component, sustainability begins with a village community and village forests on which the community is dependent; ultimately, it encompasses the entire ecosystem; and through it, all the ecosystems comprising an ecoregion.

How to manage our existing unsustainable forests so that they gradually and progressively become *less* unsustainable will be addressed in a separate document.

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SUMMARY

Forests of India were and still are, largely managed for Sustained Yield of industrial timber assuming that sustainability of timber yield would be achieved. (Little difference was, however, perceived between Sustainable Yield of timber and Sustainable Forests). In practice, this did not happen. If Sustainable Yield does not mean Sustainable Forests then, what are these Sustainable Forests? Little is known, much less is documented about the numerous attributes of such forests. Hence this effort based on the author's field observations spanning about three decades. Sustainable Forest Ecosystems have several dimensions and sub-systems; Timber Production is just one of them. They are so much interwoven that if you touch one, you touch all. It is conceptualized that Sustainable Forests are environmentally sound, ecologically stable, healthy and supportive of all life forms which inhabit them; also, concomitantly, sustain forest dependent communities. It is argued that, Sustainable Forests cannot exist without Sustainable Communities. Also, if a part of a given forest ecosystem, say a village forest, is not sustainable, then the whole forest ecosystem cannot be sustainable. Sustainable Forest is a self-propelling, self-sustaining, self-fertilizing and self-regenerating machine designed by Mother Nature. It is a multi-species, multi-layered and all-aged crop. Its composition, architecture and alignment of various species within and between various layers is such that, it uses solar energy optimally at different levels as well as uses soil fertility optimally at different depths. In view of this, the biomass production is optimum, other things remaining the same. Sustainable Forests imply environmentally sound Logging, Harvesting, Transporting, Processing and Consumption.

लम्बे समय तक चलने वाले वन केसे होते है ?

एस०ए० शाह

सारांश

भारत के वन औद्योगिक प्रकाष्ठ की लम्बे समय तक प्राप्ति देते चले जाने के लिए यह मानकर प्रबन्ध किए जाते रहे और अब भी किए जाते रहे हैं कि प्रकाष्ठ की लम्बे समय तक मिलने वाली प्राप्ति लेना संभव हो जाएगा ! (लम्बे समय तक मिलने वाली प्रकाष्ठ की प्राप्ति और लम्बे समय तक चलने वाले वनों में कोई अन्तर ही नहीं समझा गया) व्यवहार में यह संभव नहीं हो पाया। यदि लम्बे समय तक मिलने वाली प्राप्ति का अर्थ लम्बे समय तक चलने वाला नहीं होता तो ये लम्बे समय तक चलने वाले वन क्या होते है? ऐसे वनों की बहुसंख्य विशेषताओं के बारे में कम ही ज्ञात है, उसके बारे में लिखा पढ़ा तो उससे भी कम है। इसीलिए लगभग पिछले तीन दशकों

में लेखक द्वारा किए गए क्षेत्र प्रेक्षणों के आधार पर उसके द्वारा यह प्रयत्न किया जा रहा है। लम्बे समय तक चलने वाली वन परिस्थिति–संहतियों के कई आयाम और उप संहतियाँ होती है। उनमें से प्रकाष्ठ उत्पादन केवल एक आयाम है। और ये आयाम इतने ज्यादा परस्पर ग्रथित होते हैं कि एक को छूआ तो सभी पर हाथ लग जाता है। अवधारणा यह बनाई गई है कि लम्बे समय तक चलते वन पर्यावरणतः सुष्ठु, पारिस्थिकीतः टिकाऊ, स्वस्थ और उनमें रहने वाले सभी प्राणी रूपों के लिए सहायक होने चाहिऐं। तथा, साथ–साथ, यह भी कि उससे वनों पर आश्रित समुदाय चलते रहने चाहिऐं। तर्क यह दिया गया है कि लम्बे समय चलता वन चलते रहते समुदायों के बिना चलता रह ही नहीं सकता। तथा यह भी कि यदि किसी वन परिस्थिति संहति का कोई भाग जेसे कि ग्राम वन, लम्बे समय तक नहीं चलता तो पूरी वन परिस्थिति संहति ही लम्बे समय तक चलती नहीं रह सकती। लम्बे समय तक चलने वाला वन प्रकृति माता द्वारा आकल्पित स्वयं प्रणोदी, स्वयं संधारी, स्वयं उर्वरी और स्कयं पुनरोत्पादी यन्त्र होता है। यह बहुजाति, बहुस्तरी और सर्वआयु सम्य होता है। इसका गठन, वास्तु रचना और अंकन अन्तरी में विविध स्तरों के भीतर और उनके अन्दर इस प्रकार बना होता है कि अपने विभिन्न स्तरों पर यह सौर ऊर्जा और अपनी विभिन्न गहराइयों पर यह मृदा उर्वरता का इष्टतम उपयोग करता है। इन बातो को ध्यान में रखें तो जैवपुंज का उत्पादन इष्टतम होता है, यदि अन्य बातों में कोई परिवर्तन न हो तो। लम्बे समय तक चलने वाले वनों में पर्यावरणतः सुष्ठु प्रकाष्ठ निष्कासन, फसल कटाई, परिवहन विधायन और उपभोग अन्तर्निहित हैं।

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