KALPAVRIKSHAS- THE BENEVOLENT TREES

(Scientific Interpretation)

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Myth or Real:

Both mythological and canonical literature of ancient religions of India is replete with references about miraculous benevolence of Kalpavrikshas. What actually was nomenclature for good dense mixed polyculture forests with variety of trees, shrubs and herbs, yielding vast variety of products catering to all tangible needs of mankind; the term Kalpavrikshas became, through passage of time, with superstitious superlatives and attributes for a particular tree, 'Adinsonia digitata' which is even now found in many forest areas. Of course the tree provides edible fruits like many other trees and is also known as bread tree. But it is difficult to understand as to how and why, since what point of time people started revering and worshipping it for bestowing all sorts of material boons, money, children, remedies for diseases, successes in various fields. It is tragedy of human mind that if someone gets some sort of benefit actually as a result of his efforts but may be after failures and perchance by paying homage to some object tree or even an inanimate stone gets success, though continuing effort, attributes success to that object. It is then spread through by multiplier effect. Many objects and persons of past, with special qualities, through legends got exalted and deified as supernatural.

The deities Rama, Hanuman, Krishna, Mahavira, Buddha and earlier Shiva and Durga all were real humans who with their pious, noble and ideal deeds benefitted and moulded the society. In recent history we know that Karnimata, Rani Gangabai, Jeenmata, Bhatiani Rani and others in Rajasthan were real good persons and have been deified and their idols put in temples to commemorate their benevolent deeds. It is good to respect and worship them as an object of concentration to recollect and then inculcate and follow their ideals, but worshiping to beg boons and that they should come and do things for us, is abject superstition. These icons whom people worship, themselves did not beg or kept idling and waiting for someone to come and solve the problems but made commensurate and matching efforts in a given situation of war, natural calamity or any other adverse circumstance, to solve the problem themselves. We should emulate them rather beg and wait for them to come and solve any of our problems. Any problem natural or created by us or adversary can only be solved by us with appropriate action and effort. History bears testimony that any amount of praying, worshipping or performing rituals to appease deities or planets never solved any problems and we were defeated repeatedly and no deity ever came to help. Whatever worship or ritual one may perform it is action and effort that is required to get anything, may be success, monetary needs etc. The student will certainly not

succeed in examination without studying even if he keeps praying for all the time. If any deity is at all helpful then to prove it, let anyone stop doing anything and see if things are done, even food has to be earned, prepared and eaten. It is paradoxical that even highly educated persons and scientists beg boons from idols which are lifeless and helpless themselves and cannot do anything for themselves and protect even themselves as any thief can steal and take away and an iconoclast can damage them. When these idols depend on devotees for their maintenance and protection, how can they do anything and protect others?

The same misconception ad superstition got attached with Kalpavrikshas and the benefits from numerous varieties of trees were condensed in one single tree which when worshiped and requested was supposed to give whatever was desired. Legendry apocryphal literature has been accentuating such irrational superstitious beliefs. However, careful and rational examination of relevant literature on Kalpavrikshas, reveal the truth and their reality. Kalpavrikshas, as generally believed and mentioned in scriptures did not give prepared dishes of food, stitched clothes, shelters, utensils or anything wanted but provided the material for all such needs as all types of trees do. **Tilloyapannati**, two thousand years old canonical Jain scripture gives a very vivid description of Kalpavrikshas, the term has been used for all the varieties of trees in forests and not for anyone specific tree. In list of Kalpavrikshas there is mention of trees such as Ashoka, Champa, Am (Mango) एतच् which we see even at present. There is mention of their fruits, leaves and new sprouts.

तव्वाहिरे असोयं समच्छद चंपयाय चूदवणा।पूवादिसु णाणातरू चेत्ता चिदंति चेत्त तरू सहिया।।**30**।।Part1, Section3.

विविहंकुर चॅचइया विविह- फला विविह- रयण परिणामा।छत्रादि छत्त-जुदा घंटा-जालादि-रमणिज्जा।।**35**।।---"-----

तीए गुच्छा गुम्मा, कुसुमंकुर- फल- पवाल- परिपुण्णा।बहओ विचित्त- वण्णां, रूक्ख- समूहा समुत्तुंगा।**327**।Part2. Sec3.

There is clear mention were trees with flowers, fruits, new shoots as trees as vegetation have. In spite of this they have not been put under vegetation (वनस्पतिकाय) but under earth-form (पृथ्वीकाय) which is wrong and erroneous, may be in metaphoric metonymical style or writing so typical of literature of that period or it may be indication of stone- age. The reality is that they were trees (vegetation) of climax forest type and not earth-form.

Types of Kalpavrikshas:

Broadly ten types of these benevolent trees have been mentioned. These are 'Bhojanang' (yielding edible fruits, seeds, nuts etc.); 'Panang (yielding liquid products for drinking); 'Alayang' (providing material for building shelter); 'Vastrang' (yielding fibres and flosses for clothing); 'Bhajanang (giving material for making utensils); 'Turyang' (providing material for making musical instruments); 'Bhushanang' (providing things like beads, for ornamental objects); 'Dipang' (yielding material used for lighting); 'Malang' (giving material for

decorative purposes as flowers) and 'Tejang' (with dense, high and spreading crowns helping in protection from harmful radiation of sun)

पाणंग-तरियंगा, भूसण-वत्थंग-भोयणंगा य। आलय-दीविय-भायण-माला-तेजंग आदि कल्पतरू। ।**346**। ।Part2 Section4

It is important to note in the above excerpt the word 'आदि' i.e. etc. which implies that there were other more types than above ten types. There are various types of trees even now in the remnant existing forests which yield products mentioned above and many more viz. various colours, gums, resins, medicines, chemicals etc. Noble laureate Melvin Kelvin found a tree Copaiba Copaifera in forests of Brazil which yielded a liquid of same properties as diesel that could be used directly in vehicles without processing and treatment.

Cyclic Retrogression & Progression:

In modern forestry phenomenon of retrogression and progression are well documented and established. If a good forest with higher variety of trees is subjected to biotic pressures of increasing human and animal population, resulting in over exploitation, grazing, cutting and burning; then the forest degrades to lower and lower variety of trees from moist evergreen to deciduous and xerophytes and thorny shrubs, then to grass land and eventually to barren and naked landscape. It is established fact that initially there were good dense forests what are technically described as climax forest types. Such forests have highest evolved variety of trees which regenerate naturally over and over again if not over exploited beyond their carrying capacity. In this eco-system all life-forms act and interact symbiotically. Even carnivores like tigers, wolves etc. were then not killers but scavengers that lived on naturally dead bodies which were available in plenty. The degradation started with increasing biotic pressure and accentuated after the birth of agriculture and more with rapid industrialisation. The degradation of any eco-system is retrogression. If the process is reversed and biotic pressure is withdrawn from degraded land even the barren naked landscape improvement will start and gradually first grasses and then higher and higher variety of vegetation will get established to eventually good dense climax forests. The gradual improvement in a eco-system is progression.

These scientific phenomena of retrogression and progression have been elaborately dealt with in Jain literature, very comprehensively in "**Tilloyapannati" by Yati Vrishabhacharya** as cyclic changes. The one time cycle repeats over and over again and is divided in six descending and six ascending eras. These eras are Sukhma-Sukhma (Happy-Happy or Happiest); Sukhma (Happy); Sukhma-Dukhma (Happy-Unhappy); Dukhma-Sukhma (Unhappy-Happy); Dukhma (Unhappy) and Dukhma-Dukhma (Unhappy-Unhappy). This is descending order and its reverse is ascending order and both make a complete time cycle, repeating incessantly. The description of Sukhma-Sukhma (Happiest) era conforms to conditions as in climax forest. There was no erosion and water channels were perennial with pure crystal clear water. There were large number of varieties of trees, shrubs and herbs,

yielding variety of products to cater to all needs of human beings and animals. Following excerpts from Tilloyapannati describe the conditions during Sukhma-Sukhma era:

सुसमसुसम्मि काले भूमी रज- धूम- जलण- हिम रहिदा।कंठिय अब्भसिला- विच्छियादि कीडोवसग्ग परिचिता।।**324**।।

णिम्मल- दप्पण सरिसा,णिंदिद दव्वेहि विरहिदा तीय।सिकदा हवेदि दिव्वा, तणु- मण- णयणाण सुय जणणी।।**325**।।

तीए गुच्छा गुम्मा, कुसुमंकुर- फल- पवाल- परिपुण्णा।वहओ विचित्त-वण्णा, रूक्ख समूहा समुत्तुंगा।।**327**।।

वग्घदी भूमिचरा, वायस-पहुदी य खेयरा तिरिया।मंसाहारेण विणा, भुंजते सरतरूण महुरफलं।।**396**।।

In subsequent periods (eras) Sukhma, Sukhma-Dukhma, Dukhma-Sukhma, Dukhma, and Dukhma-Dukhma the conditions gradually deteriorated because of the increasing needs of rising population and corresponding increase in consumerism. Pressure on Kalpavrikshas went on increasing and they were badly degraded by the end of Sukhma-Dukhma. According to Jain Chronology present era is Dukhma, beset with serious problem of land, water and air pollution, which if not checked will accentuate further. The gradual deterioration of conditions has been described in detail by Yati Vrishabhacharya in Tilloyapannati and by Jinsenacharya in Adipurana. This conforms to the phenomenon defined as retrogression in modern ecology and forestry. The trees catering to needs of people dwindle with declining yields. The higher varieties of trees yielding edible fruits, flowers, seeds and nuts were replaced by lower varieties of vegetation of shrubs and grasses. The consequences were also manifest in climate change, storms, erratic rains, erosion of productive land and pollution.

सुरतरूं -लुघ्दा जुगला, अण्णोण्णं ते कुणंति संवादं।।**458**।।कद्दम- पवह- णदीओ, आदिट्ठ- पुवाओताव दट्ठणं।।**492**।।

कप्पदुम्मा पणट्ठा, ताहे विविहो सहीणि सस्साणिं।।**504**।।साालि-जव-वल्ल तुनरी-तिल-मास-प्पहुि विविह छण्णाई।।**507**

[Tilloyapannati part2 Section 4]

कल्पवृक्षोचितं स्थानं तान्यध्यासित स्फुटेम।।**184**।।

षाष्टिका: कलमव्रीहियवगो घूम कङ्गव।श्यामाकको द्रवोदार नीवारवर का स्तथा।।**186**।।

The plant varieties of grains, cereals, oil seeds and others mentioned above are botanically grasses am d lower forms of plants than trees.

Arresting Cyclic Changes:

Hopefully, in Tilloyapannati it is interesting to note that certain geographical areas viz. Harivarsa, Hemvata, Hairanyavata; Kaccha Videh etc. have been mentioned as areas immune from cyclic changes involving retrogression. This means that people there controlled their numbers and needs (consumption) within the carrying capacities of natural

resources and arrested further degradation by judicious management. It is also important to note that degradation was arrested at different stages at some places at Sukhma and at others at Sukhma-Dukhma stage which means that people there realised their follies at that period and took corrective measures from that point of time. This is same as advocated in modern forestry and recent doctrine of sustainability.

अवसेस वण्णणाओ सुसमस्स व होंति तस्य खेत्तस्य।णवीर अवट्ठिद रूवं, परिहीणं हाणि वड्ढीहिं।।**1767**।।

[Tilloyapannati Part2 Section4]

In **Harivarsa** the conditions always remain same as in Sukhma.

अवसेस वण्णणाओ सरिसाओ सुसमदुस्समेणं यि।णवीर अवट्ठिद- रूवं परिहीणं वड्ढीहिं।।**1726**।।

[Tilloyapannati Part2 Section4]

In Hemvata the conditions always remain as in Sukhma- Dukhma.

परचक्क- भीदि- रहिदो, अण्णाय पयट्ठणेहि परिहीणो।अइवट्ठि- अणावट्ठी- परिचत्तो, सव्व कालेसुं।।**2277**।।

[Tilloyapannati Part2 Section4]

In Kaccha Videh there is never lawlessness, use of unfair means and never shortage or excess of rainfall and the area is immune from retrogression.

Such ecological perceptions in ancient Jain literature are astounding. These have now been recognised in modern ecological and environmental sciences.

Birth of Agriculture of Agriculture:

Scientific evidence indicates that agriculture was adopted around 8000 years ago and it was accidental. The food collector ancestor accidentally dropped seeds of some grasses collected from forests nearby his hut. To his surprise he observed that the seeds sprouted and after three months bore the same seeds. He then pondered and decided that it will be convenient and easy to grow such edible seeds near his residence than the cumbersome and laborious daily routine of going round forest to get food and he started cultivating few grasses. Others followed him and the number of people adopting cultivation grew rapidly. The concept of individual property also evolved with agriculture and with it the ensuing feuds, conflicts, clashes and small and big wars. Since agriculture depend on timely adequate rains, it suffered from vagaries of nature and this gave rise to a class of wily persons who professed to tell future and prescribed various rituals to ward off the bad fortune; gullible and ignorant people got entangled in the crafty tricks and fattened the purses of tricksters, believing and subscribing to numerous unscientific superstitions which are galore even now in spite of astounding scientific progress.

According to Jain chronology Tirthankar Rishabdeo was approached by people for solution of food problem as the benevolent Kalpavriksha trees had dwindled far too much and the yields were far short of the requirements. He advised agriculture as a short term measure and planting of trees as a permanent solution. There appears a serious misunderstanding that he taught only agriculture i.e. planting of only agricultural crops. Planting technology includes planting of seasonal as well as perennial trees. The wisdom of such a genius as Rishabdeo could not ignored the perennial trees. Trees once planted as mixed polyculture forest, if managed properly and scientifically perpetuate by regenerating naturally over and over again from natural seed dispersal of seed through birds, animals, insects and other organisms. Rodents and rats which are considered menace in agriculture are useful in forest as they keep on turning and churning the soil like a plough. Forests are self manuring, self watering and do not require recurring input costs year after year, crop after crop as in agriculture. All life forms live symbiotically without any sort of **Violence (Himsa).**

Rishabdeo was apostle of **Non-violence (Ahimsa)** and could not have advised only agriculture which involves lot of **Violence** every crop year after year always. He must have advised agriculture only as a temporary measure and trees as permanent solution. In **Taungya** system of tree planting landless people are given forest land for cultivation and planting tree saplings at 15'x15' spacing to facilitate cross cultivation and agriculture crops are raised till plants are high and start shading the crops affecting the yield adversely. The planters are then allotted another area. Excellent tree plantations were raised by this method free of cost by forest department but the practice had to be abandoned because so called leaders (netas) incited people to claim the allotted land permanently under tenancy laws. Rishabdeo must have advised this technique as a temporary as well as a permanent solution of the problem. Since trees (Kalpavrikshas) had dwindled and requirement of food was not possible from remnant stock it was necessary to resort to agriculture till such time the trees grow and provide necessities. Taungya system could have solved the problem.

In his study and research thesis on 'Harappa Culture and Vedic Literature' Bhagwan Singh has brought out startling facts in the chapter, "Agriculture Revolution and Sura-Asura or Deva-Rakshasa Battles". For agriculture it is prerequisite to clear the land out of natural forest area by cutting and burning the vegetation. With birth of agriculture people were divided. While many adopted agriculture and this group was known as Suras or Devas. The word 'Sura' is from the root 'sur' meaning to do i.e. to get food etc. by efforts like cultivation. Others opposed it and were determined to zealously protect natural forests to get their food etc. from there and were called Rakshasas. The word 'Rakshasa' is from the root 'Raksha' which means to protect. Suras or Devas were extending their agriculture by cutting and clearing natural forest and Asuras or Rakshasas were resolute to oppose it and protect it. This was the cause of the ensuing numerous fierce battles between the two groups; mentioned in scriptures. Unfortunately Rakshasas were defeated not because of the superiority of Devas in warfare or civilisation but mostly by deceitful tactics engineered by so called almighty Vishnu and his incarnations. Other important cause of the defeat was that

the Devas destroyed surreptitiously and insidiously the forests on which Rakshasas depended. Thus an ideal and highly developed forest based civilisation was destroyed by **the** crafty and cunning Devas, crusading against forest, cutting, burning vast areas indiscriminately as ordained in Vedas also that cultivable areas should be cleared and brought under agriculture.

The recent detailed research and insight in Harappa and Sindhu Ghati civilisations have revealed that extensive belts of trees were raised along with agricultural crops. This vindicates that an iconic towering person Rishabdeo by his intervention and advice might have brought about compromise between the two warring groups. Obviously he did not advise only agriculture but tree planting simultaneously.

Consequences:

With passage of time the lure for agriculture grew more and more because it gave quick returns within 3-4 months. There was crusade against forest and vast tracts continued to be cleared and burnt for agriculture. We read about 'Khandavdah' in Mahabharata and in recent history about alluring incentives and benefits given to people venturing into agriculture almost all over the globe including India and even America. Initially there was bumper crop from nutrients rich virgin forest soil after clearing and burning but got depleted in 5-6 years and then new areas were cleared and cultivated till last boundary of a particular village. Nature has a tremendous capacity to redeem and since the available area was large, people returned to the area cultivated in first instance and then continued to the end and so on in rotation of 20-30 years. This practice of shifting cultivation worked till population was not large as at present and forest area was extensive but with population rising and forest area shrinking and getting depleted the cycle of rotation gradually decreased to 5-6 years, the time frame not sufficient to redeem forests, yet people continued to eke out existence on declining returns and compensating by cutting forests and selling wood. In spite of ban this pernicious practice of shifting cultivation is still in vogue in tribal areas and most of the landscape has made barren.

The ill effects of continued destruction over centuries is manifest in recurring disastrous floods, droughts, famines and misery for teeming millions. Presently the situation and conditions are nearly at critical levels and the air we need to breathe, water we need to drink and the soil from which from which we get food to survive, are so badly polluted that the very survival is in peril.

There is no agriculture technology yet evolved that does not degrade soil and environment. Modern hi-tech agriculture is highly polluting. It is invariably monoculture and therefore prone to damage by various pests. The indiscriminate use of irrigation water, chemical fertilisers and poisonous pesticides has polluted soil, water and air. Agricultural practices contribute over 40% of total pollution of the environment. The poisonous pesticides go into the human system through food and water and cause numerous serious diseases and have

even started damaging the chromosomes which will affect generations to come. Pesticides have been found in the milk of lactating mothers, affecting the health of the children and are cause of concern. The use of pesticides is deliberate violence (Sankalpi Himsa) which is considered most heinous in Jainism and is totally forbidden. In developed nations there is now growing preference for organic food which is free from use of chemical fertilisers and pesticides. Such foods are sold at much higher prices as 'Health foods' and yet preferred. Jains should have taken lead in production and publicity of organic foods but no such effort is there and even monks are given the food involving deliberate violence.

Redemption:

The deteriorating situation can be reversed and corrected. Redemption is not difficult. The polluting and damaging agricultural practices can be easily replaced by forestry practices, using Taungya system of tree planting in which agricultural crops are also raised along with tree planting till such time the trees mature to provide edible products. The mixed polyculture forests will provide all the necessities and will be everlasting if managed properly and scientifically. In forestry there are no recurring input costs as in agriculture. Huge subsidies are required to sustain agriculture which is not at all economically viable and in spite of being highly subsidised suicides in farmers are increasing. There is no violence of any sort involved in forest based life style. There is lot of violence in every agricultural practice from ploughing to manuring, watering and much more in use of pesticides. Forests conserve soil and moisture most efficiently; every tree is a dam more efficient and cheaper than any concrete one. There is no soil erosion and every drop of water is conserved in situ at the very place it falls. It has been experimentally established that infiltration of rain water in good forest area is up to 99% and very little water goes as run-off. Water is available in water sources, rivers, streams, lakes, wells and tanks all the year round from underground sources which get fully recharged. Forests do not need any pesticides as there is natural balance of pests and predators in mixed forests. In forest based life style there is automatic control on population without any coercion or artificial measures. In an experiment on wolves in Germany the procreation was slowed and accelerated according to the availability of natural food from forests.

The average annual yield of edible seeds and nuts alone will be around 2 tonnes per hectare. In addition edible flowers, fruits, leaves and tubers are also available. Besides this forests provide host of products, timber, fuel, fodder, medicine, fibres and chemical for domestic and industrial uses. The world average annual yield from agriculture is about 1.25 tonnes per hectare and that too at the mercy of nature, its vagaries in form of excess or deficient rainfall, storms, epidemics of pests may destroy the crops partially and even wipe out totally. The nutrition from forest seeds etc. is superior to that from grains from agriculture. My project 'Human Nutrition from Forest Seeds' was sanctioned by Department of Science and Technology' and Ms Sneh Sharma has done PhD on it. In the first phase of this project the nutritional status of forest seeds was determined and it has been

conclusively proved that there are far more nutritious and free from toxicity as in case of agriculture products from chemicals used extensively. Indian Agriculture Research Institute, Delhi; Forest Research Institute, Dehradun and National Institute of Nutrition, Hyderabad have also done valuable work to establish nutritional superiority of forest edible products.

Revival of golden era of yore, the like of Sukhma, is possible by recreating pristine climax polyculture forests with variety of trees, the Kalpavrikshas, yielding variety of products, edibles, fibres for clothing, timber for building and various other purposes, medicines, chemicals and a host of others to cater to all sorts of needs. Such a forest based model of life will extricate mankind from all sorts of evils, pollution, food and water shortages, pestilences, wars and conflicts and usher in the coveted peaceful and happy era as in Sukhma period.