



Safe and Functional Agreeculture

“Agriculture is the culture that we agree upon”

Dr. Nagaraj Hegde Goranmane
Kavya Horantur Palachandra

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ಅಧ್ಯಕ್ಷರ ನುಡಿ

'ಸೇಫ್ ಆಂಡ್ ಫಂಕ್ಷನಲ್ ಅಗ್ರೀಕಲ್ಚರ್'

'ಸೇಫ್ ಆಂಡ್ ಫಂಕ್ಷನಲ್ ಅಗ್ರೀಕಲ್ಚರ್' ಕೃತಿಯ ಹೆಸರಲ್ಲೇ ಅಗ್ರೀಕಲ್ಚರ್ ಎಂಬ ಪದ ಬಳಕೆ ಮಾಡದೆ ಅಗ್ರೀ ಕಲ್ಚರ್ ಎಂದಿರುವುದು, ನಾವು ಅಗ್ರೀ ಮಾಡುವ ಅರ್ಥಾತ್ ಒಪ್ಪಿಕೊಳ್ಳುವ ಸಂಸ್ಕೃತಿ ಎಂಬ ವಾಕ್ಯವನ್ನು ಅದರ ಜೊತೆ ಸೇರಿಸಿರುವುದೇ ಕೃತಿಯ ಅಂತರಾಳವನ್ನು ಯಶಸ್ವಿಯಾಗಿ ಬಿಂಬಿಸಿದೆ. ಅಡಕೆ ಕೃಷಿಕರಿಗಲ್ಲಾ ಮಹದುಪಕಾರ ಮಾಡಿದ ಬಯೋಫೈಟ್ ಜನಕ, ಸಂಶೋಧಕ, ಉದ್ಯಮಿ, ಲೇಖಕ ಡಾಟನಾಗರಾಜ ಹೆಗ್ಡೆಯವರು ಲಿಪಿ, ಭಾಷೆಗಳಿಗಿಂತಲೂ ಮೊದಲೇ ಹುಟ್ಟಿದ ಕೃಷಿಯು ಎಲ್ಲ ಸಂಸ್ಕೃತಿಗಳ ತಾಯಿ ಎಂದಿದ್ದಾರೆ. ಜಗತ್ತಿನ ಪ್ರಥಮ ಕೃಷಿಕೃತಿ 'ಕೃಷಿ ಪರಾಶರ'ದಿಂದ ಹಿಡಿದು ವೇದಗಳು, ತ್ರೇತಾ-ದ್ವಾಪರ ಯುಗಗಳಲ್ಲಿನ ಕೃಷಿ, ಉಳುಮೆ ವಿಧಾನಗಳು, ಜಗತ್ತಿನ ಕೃಷಿ ಕ್ರಾಂತಿಗಳು, ವಿಭಿನ್ನ ಮಾದರಿಗಳು, ಸಸ್ಯಗಳ ವ್ಯಾಧಿ ಪರಿಹಾರ ಸೂತ್ರ, ಸಸ್ಯಗಳಿಗೆ ಆಹಾರದಿಂದ ಪೋಷಣೆ ಎಲ್ಲವನ್ನೂ ಅಪ್ರತಿಮವಾಗಿ ವಿವರಿಸಿದ್ದಾರೆ. ಆಹಾರ ಸುರಕ್ಷತೆ, ಸಾವಯವ ಕೃಷಿಯ ಮಹತ್ವ ಸಾರುವ ಈ ಕೃತಿಯ ಕೊನೆಯ ವಾಕ್ಯದಲ್ಲಿ 'ಉತ್ತಮೋತ್ತಮ ಜನರು ಭೂಮಿಯಲ್ಲೇ ಸ್ವರ್ಗ ಸೃಷ್ಟಿಸುತ್ತಾರೆ' ಎಂದಿದ್ದು ಕೃಷಿಯಿಂದಲೇ ಸ್ವರ್ಗ ಕಾಣಬಹುದೆಂಬ ಆಶಯವನ್ನು ಬಿಂಬಿಸಿದೆ. ಎಲ್ಲರೂ ಓದಲೇಬೇಕಾದ ಕೃಷಿಯ ದಾಖಲೆಗಳುಳ್ಳ ಅಪೂರ್ವಕೃತಿಯಿದು.

ಭಾರತೀಯ ಸಾರಸ್ವತ ಸಂವಹನ ಕ್ಷೇತ್ರದ ಭಾಷಾ ಪ್ರಪಂಚದಲ್ಲಿ ಹವ್ಯಕ ಭಾಷೆಯು ಹಲವು ವಿಶೇಷತೆಗಳಿಂದ ಪ್ರಬುದ್ಧ ಹಾಗೂ ಸಮೃದ್ಧವಾಗಿದೆ. ಹವಿಗನ್ನಡ ಎನಿಸಿಕೊಂಡ ಈ ಭಾಷೆಯಲ್ಲಿ ನೆಲದ ಸೊಗಡಿದೆ, ಸಂಪ್ರದಾಯದ ಸತ್ವವಿದೆ, ಸಮುದಾಯದ ಸ್ವಂತಿಕೆಯಿದೆ, ದೇಶೀಯತೆಯ ಆಶೋತ್ತರವಿದೆ,

ಪರಂಪರೆಯ ಪರಾಮರ್ಶೆಯಿದೆ, ಕರುಣಾಮಯಿ ಹೃದಯಗಳ ಮುಗ್ಧತೆಯಿದೆ, ಬುದ್ಧಿವಂತ ಮನಸ್ಸುಗಳ ಅಭಿಲಾಷೆಯಿದೆ, ಪ್ರಜ್ಞಾವಂತ ಚಿಂತನೆಯ ಪ್ರಖರತೆಯಿದೆ. ಹವ್ಯಕ ಸಮುದಾಯವೊಂದಕ್ಕೆ ಸೀಮಿತವಾಗಿರುವ ಹವಿಗನ್ನಡವು ಸೀಮೆಯಿಂದ ಸೀಮೆಗೆ ಮತ್ತೆ ಮಾರ್ಪಾಡು ಹೊಂದಿ ಪ್ರದೇಶವಾರು ಆರೇಳು ರೂಪದಲ್ಲಿ ರೂಢಿಯಲ್ಲಿರುವುದು ದೇಶದ ಭಾಷಾ ವೈವಿಧ್ಯತೆಯ ನಡುವೆ ಐತಿಹಾಸಿಕ ಹಾಗೂ ಸಾರ್ವಕಾಲಿಕ ದಾಖಲೆಯಾಗಿ ಉಳಿಯುತ್ತದೆ. ಇಂತಹ ಹವಿಗನ್ನಡ ಸಾಹಿತ್ಯ ಲೋಕದಲ್ಲಿ ಮೂಡಿಬಂದ ಅನುಪಮ ಕುಸುಮವಾಗಿರುವ ಈ ಕೃತಿಯನ್ನು ತಮಗರ್ಪಿಸಲು ಹವ್ಯಕ ಮಹಾಸಭೆಗೆ ಹೆಮ್ಮೆಯಿದೆ.

ಸ್ವಾತಂತ್ರ್ಯಪೂರ್ವದಲ್ಲೇ ಜನಿಸಿದ ಹವ್ಯಕರೆಲ್ಲರ ಪ್ರಾತಿನಿಧಿಕ ಸರ್ವೋಚ್ಚ ವಿಶ್ವವ್ಯಾಪಿ ಸಂಸ್ಥೆಯಾದ ಶ್ರೀ ಅಖಿಲ ಹವ್ಯಕ ಮಹಾಸಭಾವು 75 ವರ್ಷಗಳನ್ನು ಪೂರೈಸಿದ ಶುಭಸಂದರ್ಭದಲ್ಲಿ ಅಮೃತ ಮಹೋತ್ಸವ ಹಾಗೂ ದ್ವಿತೀಯ ವಿಶ್ವಹವ್ಯಕ ಸಮ್ಮೇಳನಗಳನ್ನು ಬೆಂಗಳೂರಿನ ಅರಮನೆ ಮೈದಾನದಲ್ಲಿ ಆಚರಿಸುತ್ತಿದೆ. ಈ ಐತಿಹಾಸಿಕ ಕ್ಷಣದಲ್ಲಿ ಅಮೃತ ಮಹೋತ್ಸವ ಗ್ರಂಥ ಮಾಲಿಕೆಯಡಿ 75 ಸುಪ್ರಸಿದ್ಧ ಲೇಖಕರು ಬರೆದ ಹವ್ಯಕರ ಸಂಸ್ಕೃತಿ, ಸಂಸ್ಕಾರ, ಸಂಪ್ರದಾಯ, ಸ್ವಾಧ್ಯಾಯ, ಸ್ವಾನುಭವ, ಸಾಧನೆಗಳಿಗೆ ಸಂಬಂಧಿಸಿದ 75 ಪುಸ್ತಕಗಳು ಏಕಕಾಲಕ್ಕೆ ಲೋಕಾರ್ಪಣೆಯಾಗುತ್ತಿರುವುದು ಸಾಹಿತ್ಯ ಲೋಕದಲ್ಲಿನ ಅಪರೂಪದ ವಿದ್ಯವಾನ್ವಿತವಾಗಿ ಇತಿಹಾಸ ನಿರ್ಮಾಣವಾಗುತ್ತಿರುವುದು ಅತೀವ ಸಂತಸದ ಸಂಗತಿಯಾಗಿದೆ.

ಕೃತಿಕಾರರ ಹೃದಯಸ್ಪರ್ಶಿ ಸ್ಪಂದನೆಯು ನಮ್ಮಲ್ಲಿ ಧನ್ಯತಾ ಭಾವವನ್ನು ಸೃಜಿಸಿದೆ. ಕೃತಿಕಾರರು, ಸಂಪಾದಕ-ಸಂಚಾಲಕ-ಪ್ರಕಾಶಕ ಹಾಗೂ ಓದುಗರು ಧನ್ಯರು, ಅಭಿನಂದನಾರ್ಹರು.

ಡಾ. ಗಿರಿಧರ ಕಜೆ

ಅಧ್ಯಕ್ಷರು,

ಶ್ರೀ ಅಖಿಲ ಹವ್ಯಕ ಮಹಾಸಭಾ(ರಿ),
ಬೆಂಗಳೂರು.

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We want to acknowledge the source of inspiration to the ultimate energy what people call as “GOD”. As mentioned in *Dhanyashtakam* composed by Jagadguru Shri Shankaracharya Mahasannidhanam “*Kurvanti karma paripaaka phalaanidhanyaah*” We would like to surrender the fruits of our action at the altar of god in the name of result.

To begin any task, it needs inspiration. Our proud historic epics, *vedopanids*, other literature like Krishi Parashara, and authors of these great works like Sage Valmiki, Vyasamuni, Rishi Parashara, Kashyapa muni and many others are the true inspiration.

Safe and Functional Agriculture is attempt to protect quality of nature, secure the rights of farmers and the consumers. We believe, being a part of the society, it is our responsibility to do our bit to preserve and maintain the balance in our ecosystem. Vedic form of agricultural practices recognizes and respects the relationship we have with our environment. We hereby dedicate this book to all the farmers across the world who are dedicating their whole life to feed the entire humankind and continuously involved in country`s progress.

Success of any technology or new approach is not outcome of an individual effort. It is a golden harvest of the determination of group of people. We thank the director of the Company High Tech Agriculum and all associated members starting from production team, research and

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Dr Nagaraj Hegde Goranmane
Kavya Horantur Palachandra

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1

Agreeculture, an agreement with agriculture

Agriculture is older than the languages and script. All the documented papers on Agriculture, its importance and allied processes or technologies are only for the discussion sake.

“Mother of all cultures is Agriculture”. Agriculture can also be defined as the way of human intervention with the plant growing patterns. The pattern decides the method of agriculture and in turn decides the culture with which the mankind gets connected with *Panchabhutas* (*Prithvi*-Earth, *Jala*-Water, *Agni*-Fire, *Vayu*-Air and *Akasha*-Sky). According to Ayurveda and Yoga, complete health of the human being is associated with these *Panchabhutas*.

The terminologies in few languages are the bi product of Agriculture, the distance, time etc are defined with local agriculture subjects. The word *godhuli* has multiple meaning other than dusk time (evening). *Go*- means Cow and *dhul*-means dust, the dust created by cows getting up after it's grazing in the forest. In the olden days when the cows come

back from the forest after being away from villages, country men would know that evening is going to happen.

Agriculture science is a skill and a process; it is a total combination of art and science of cultivation of crops, rearing of the animals for the livelihood and economic gain. It has two main partitions Crop production and livestock production. Its eventual resolution is for food production, and fulfilment of other human needs such as shelter, clothing, medicines, tools, artistic decors and display and for economic progress.

Agriculture could be referred to as production, processing, promotion and distribution of agricultural products. In addition to provision of food and raw material, agriculture also provides employment opportunities to very large percentage of the population. It is a source of livelihood, contribution to national revenue, supply of food as fodder, significance to international trade, marketable surplus, countries GDP, source of raw material, foreign exchange resources, great employment opportunities, economic development, source of savings, food security.

Spiritual and dharmic basis for agriculture

According to the our mythology and *vedic* scriptures, our universe is designated to pass through four great epochs or *Yugas*, *Kruta Yuga*, *Treta Yuga*, *Dwapara Yuga* and *Kali Yuga*. *Satya Yuga* or the Age of Truth is said to last for 12,000 divine years (43,20,000 human years), *Treta Yuga* for divine years 3,600 (12,96,000 human years), *Dwapara Yuga* for 2,400 divine years (8,64,000 human years) and *Kali Yuga*

will last for 1,200 divine years (4,32,000 human years). We believe the process of creation moves in cycles and that each cycle has four great *yugas*, or epochs, of time.

Agriculture and the process involved in the crop raising or animal rearing, the yield and bi products of agriculture is very evidently seen from early eras starting from *Treta Yuga*.

In *Vishnu Purana*, there is a mention as throughout these four *yugas*, Lord Vishnu is said to have been incarnated ten times in ten different *avatars* known as *Dasavatara*.

Lord Rama of the epic poem, the *Ramayana* lived in *Treta Yuga*. *Ramayana*, an ancient Indian epic poem written by Sage Valmiki narrates about forest in one of its *Kanda Aranya Kanda* (Book of Forest), also he has discussed about the geography and forestry of the region in *Kishkinda Kanda*.



In *Yudha Kanda*, when Lakshmana gets severely wounded during the battle with Indrajit. Hanuman would be sent to *Dronagiri Parvatha* to fetch Sanjivini. (Life restoring herb) from Himalaya. Scientist has proven that geographical features, altitude, ecology, topography and climatic conditions are primarily responsible in making the Himalayan region a rich repository in biodiversity, especially in plant life. It has more than 400 species of medicinal Plants.

Seetha, a daughter of king Janaka is also called as daughter of earth, Seetha word also means 'to plough'. While performing a ritual for having a child, King Janaka finds Seetha while grooving the earth furrowed by the plough.

Mithele, King Janaka's kingdom was agriculture oriented province. The plough is symbolically used on the flag on Janaka's Chariot.



Next *Avathara* of Lord Vishnu is Balarama, Rama with the plough. Was his occupation was Agriculture or it just depicts the livelihood of human being during that period.



In the *Dwapara Yuga*, Lord Vishnu is reincarnated in the name of Lord Krishna was born in this age. We all know Sri Krishna during his *bala avastha* (Young age), he is depicted as mischievous, an ordinary ignorant boy stealing butter. Butter is a bi product of Milk.



Cattle rearing and dairy were the major occupation of people in Bridavan where Sri Krishna spent his childhood. Animal husbandry & Dairy Industry are allied Doctors of Agriculture.

When Sri Krishna moves to Dwarakapuri where he establish his kingdom, his good old friend Sudhama meets Krishna and offers beaten rice (*Avalakki / Poha*) to lord Krishna as it is his favourite dish. The technology of processing paddy to beaten rice was already known in *Dwapara Yuga*.

It is known that the word 'Agriculture' is derived from Latin word *Ager* means land or field and culture means cultivation. In our *puranas*, thousands of years ago it is described as Krishi is special activity or process by itself of producing food. The word Krishi meaning ploughing, cultivation of soil, agriculture, the harvest, animal husbandry, success in husbandry; the harvest (*Krishi phala*), the earth, activity in agriculture (*karmaan*), *KrishiSeva*, arable land.

The word Krishi is derived by the word *krisa vilekhana*, the act of making furrow, digging delving, uprooting mainly using a metal.

It is a continuous process starting from land preparation, sowing, weeding, applying fertiliser, irrigation till golden harvest which can ideally be achieved only by the artist. Agriculture is a special art. Only a farmer knows the fact that today`s seed is tomorrow`s harvest. There is no end for agriculture. Every man has a holiday but a soldier and a

farmer can never take a holiday there can only be an interim break or intervals. After a short relaxation again farmer get into this holy continuous process. A golden harvest can be obtained only with dedication, craft undertaken with complete control.

Agriculture has a history of thousands of years. However it is quit hard to describe as when is started and it is beyond our imagination. The evolution of agriculture can only be derived using consequential documents, treatise and manuscripts.

Vedic Agriculture

As per our *Veda* (Yajuh.18.12) “*Vrihayascha me yavascha me mashascha me tilascha me mudgascha me dhalvashcha me priyangavascha me anavascha me shyamakascha me nivarascha me godhumascha me masurascha me yajnena kalpantam*” which means May the rice be for me, may the barley be for me, may the pulses and beans be for me, may sesamum and grains be for me, may kidney beans be for me, may vetches be for me, may *Panicum frumentaceum* be for me, may wild rice be for me and may wheat and lentils be for me. May all these grains prosper me and be procured through the skill and process of agricultural science. Agriculture is the channel for prosperity of mankind.

The cultivation of the soil was no doubt known to the Indians before they separated from the Iranians, as is indicated by the identity of the expressions *yavam krs* and *sasya* in the *Rigveda* with *yao karesh* and *hahya* in the

Avesta, referring to the ploughing in of the seed and to the grain which resulted. In *Rigveda*, the expressions for ploughing is mentioned in first and tenth books, in the so-called 'family' books (ii.-vii.). The *Asvins* are spoken about the sowing of grain by means of the plough. There is clear proof of the importance attached to agriculture.

In the *Atharvaveda*, *Prthvī Vainya* is credited with the origination of ploughing. In the later *Samhitās* and the *Brāhmanas* ploughing is repeatedly referred to. In the *Pañchavimśa Brāhmana* the *Vrātyas*, Hindus without the pale of Brahminism, are described as not cultivating the soil. The land that is supposed to be ploughed was called *Urvarā* or *Ksetra*; manure (*Sakan*, *Karīsa*) was used, and irrigation was practised (*Khani- tra*). The plough (*Lāṅgala*, *Sira*) was drawn by oxen, teams of six, eight, or even twelve being employed. The operations of agriculture are neatly summed up in the *śatapatha Brāhmana* as 'ploughing, sowing, reaping, and threshing.

Agriculture (*krishi*), finds extensive mention in many *vedic* texts. The texts provide information about agriculture,



horticulture, arboriculture and plant biodiversity in *Krishi Parashara*, *Kautilya's Artha-shastra*, The Sangam literature of early Tamils, *Manusmriti*, *Varāhamihira's Bruhat-Samhita*, *Amarakosha*, *Kashyapiya- Krishisukti*, *Surapala's Vrikshayurveda*.

The subjects like conservation of soil, land reclamation, manure from green leaves, seeds, animal waste management, crop pattern, plant domestication, presence of cereals, legumes, oil seeds, fibrous crop, plant protection measures, soil treatment, Agriculture technology and agriculture implements, irrigation system , post cultivation process – reaping, threshing and winnowing, meteorological observations in relation to crop are covered in above mention books or treaties. In *Atharva veda* 300 varieties of various trees has been listed.

The sophistication of implementation of memories in water was also recognised by way of classing the rain during different period into *Nakshatra*. The characterisation of these rain water and their effect on the plants were also well documented such as the growth pattern, the incidences of disease and pest, the quality of produce, the keeping quality of grains are very much mentioned in our ancient literatures.

“*Ashwatha Sarva Vrukshanam, Devarshinam Cha Narada, Gandharvanam Chitra Ratha, Sidhanam Kapilo Muni*” means *Pipal* is a tree which releases Oxygen even during night time also, while other trees release Oxygen during day time (Phenomenon of Photosynthesis) and Carbon dioxide during night time (Phenomenon of Respiration). It means that processes and even the effect of

Photosynthesis and Respiration were well documented in such long time ago.



'*Krishi Parashar*' is the first treatise on agriculture in the whole world. He has dealt at length about rain, rain forecasting, rain measurement and field crops. The unit of rain was defined as "*Adhaka*". While, tree plantation its types, raising of nursery, grafting and transplanting have been described in *Vrukshaurveda*. Medicinal usages of different plants and its application as pesticides *etc.* have also been described by him.

Panini categorized the lands marshy river tract (*Anupa*), fertile (*apnasvati*), arid (*aartana*) on the basis of suitability of production of crops. Divisions of land, *Usara* (alkaline) and *anusara* (non-alkaline/ cultivable land) is described in *vedics* texts or *Sutra* Literature.

Garga Muni dealt with the cultivation practices of various crops.



Mahrishi Kashyap has also explained agriculture in his '*Kashyapi-krishi-sukti*' exclusively.

Kautilya in his *arthasastra* has spoken about the third crop and the idea of rotation of crops revealed in the statement "Corn ripens twice a year" 24 throws light on cultivation of grain-crop followed by cultivation of legumes, the only restorative plants fix nitrogen in the field which is exhausted with cultivation of grain-crop.

Rigveda describes *Yava* as Rain fed crop and *taittiriya Samhita* as its summer crop. The *Rigveda* recognizes two seasons of rainfall, associated with summer solstice and winter solstice.

According to *vedas* and *Upanishads*, the rain was caused by the impact of the stars (*Apaam napaat*). These include influence of the Sun during its passing to the other house, the disappearance of the constellation *Tisyā* (*Praesepe*) associated with the heliacal rising of Jupiter in

the autumn *equinox* (*Varuna*) and the rising of *Pus.an* (*Auriga*) in the western horizon along with *Asfvini-s* (*Arietus*) and the rising of the constellation *Apa* (*Sagittarius*).

Agriculture is not only the source of food, but it is a source of livelihood

Dharbha, *kusha* grass (*Desmotachya bipinnata*) usually is used as holy grass (*pavithram*) A person performing a ritual be it auspicious or inauspicious is supposed to wear a ring made of *dharbam*. When tested in laboratory, it is discovered that *kusha grass* absorbed 60% of X-ray radiation. *Dharbam* is used to cover the food items during eclipse to avoid spoilage of food due to harmful ultra violet radiations. It has the highest value in conducting the phonetic vibrations through its tip. Later, they sprinkle the Holy water using the *dharbha* grass at every nook and corner of the place, where the ceremony or function is held.

A very high state of civilisation prevailed during the *vedic* period, the forts, fortresses, walled town and cities with many gates, the clothing and accessories that people used are the valid instances.

Several stories narrate that merchants travelled overseas, it means ships and sea voyages already exist. The wool obtained from sheep and cotton obtained from plant was weaved to make fabrics for garments. The best in class chariots were made for the great warriors which were again a crafting done by fellow men using wood again derived from trees. Diseases (*Dosha*) were cured starting from

vaata, *pitta* and *kapha* till leprosy, jaundice, strokes using medicinal plants. The skin obtained post sacrifices of animals were used as protection during war to tie the Armor and the sword. The Aryan hut, in its most basic shape, was circular in plan, with a thatched roof over a bamboo network of ribs. The fence for protection against the wild animals was made of bamboo. Bamboo is used starting from the birth to death meaning from making cradle for making babies to sleep, toys for playing, Wood furniture and house for living, winnow for cleaning the groceries, dandiya for dancing and finally during *Ourdhwa Daihika Samskara* (after death).



Similarly, many trees like Coconut, Sandalwood known as *kalpavruska* where in all parts of the tree is used in several purpose to the mankind.

The human life comprises of five stages also called as *ashrams* and every person would go through each of these stages and Agriculture play a very vital role in each of these stages apart from food, clothing and shelter.

Balyavasta – the stage of childhood where yield obtained from Agriculture used starting from cradle, to toys and nutrients for the physical and mental development of the child.

Brahmacharya – the student stage where items for learning were again the produce of agriculture, the paper / books (*tale patra*), feather and ink to write.

Upanayana is the rite of passage for the start of formal education of writing, numbers, reading *Veda*, art and other skills. During *Upanayana* ritual the boys and girl were made to Yagnopaveetha, (*Janivara*). This *Janivara* is a holy (sacred) thread made of cotton strands (a bi product of Agriculture). In ancient and medieval eras, texts such as *Harita Dharmasutras*, *Asvalayana Grhya Sutra* and *Yama smriti* suggest women could begin *Vedic* studies after the *Upanayana* rite of passage.

*Yagnopaveetham paramam pavithram
Prajapatheryasahajam purasthad Aayushyamagryam
prathimuncha shubram Yagnopaveetham balamasthu
thejah!!*

Above sloka (*manthra*) on *Yagnopaveetham* describes the sanctity, spirituality and sacredness of *Yagnopaveetham* with its benefits. It says that Yagnopaveetham is "the best among those that purify, the one that has emerged along with the Brahma (*Prajapathi*) at the time of creation, that which bestows life and prominence, the one that is sacred, clean and unsoiled,

and the one which confers on to the wearer both knowledge and power.



It elucidates that thread made of cotton which is a yield of Agriculture has importance in *vedic* period.

Third stage of life is *Grihasta* or household stage begins at marriage and an individual undertake the responsibility of earning a living and support family. Here agriculture and allied business is a source of income.



Marriage starts with the *mangalya dharana mantra* where a sacred thread made of cotton or silk is tied by the bridegroom to the bride and *mangala dravya* like turmeric

and *mathrakshate* (rice mixed with turmeric) are used.

Fourth Stage is *vanaprasta* which is a stage of withdrawal of individual duty of household and moves towards *japathapa* which actually mark the age where He would have become a grandfather; his children are grown up and have established lives of their own. At this age, he should renounce all physical, material, and sexual pleasures, retire from his social and professional life and leave his home for a forest hut where he can spend his time in prayers

Last stage is *Sannyasa* which is stage of renunciation and the realization of dharma. At this stage, a person is supposed to be totally devoted to God. The *havans* are done using the produce of agriculture starting from wood pieces (*Chandana*) and ghee.

Vastraasaneena daardryam paarithaaree roga sambhavam meedinyam durikhamaapnoothi kaarime bhavati nirphalam means during performing any *Dhyana* and other auspicious rituals the poverty would curl with the use of seating made of cloth, disease and other viral microorganisms would inhibit by sitting on stone, unhappy would embellish by sitting on floor and using wooden stool would only lead to vein.

Darbhaasane jnana siddhimi, mokshasri vyaaghra charmam, karamrajine jnanasiddhi, sarva siddhistu kambam meaning *Japa* and other rituals need to be performed using *khasa* or *dharba sana* (seat made of *dharba* grass), *moksha prapti* (cycle of rebirth impelled by the law of *karma*) would happen by doing *japa* by sitting on skin of

tiger, knowledge would increase upon sitting on deer skin and knowledge as well as *moksha* would be attained by performing the *japa* by sitting on *kambali* (coarse woollen blanket obtained by sheep)

Although, we the writers, publisher or printers are not in promotion of hunting of endangered species and the use of animal skin, these are the verses taken by the *Puranas*. They have referred to the skin of the wild animals which were hunted by the warrior to protect the country men and the agriculture produce cultivated by the villagers.

The yield of agriculture is used as *pushpa pooja* and *patrapooja* in the form of garland, Bouquets and as perfumeries, holy stick and *dupas*.

All these narrations are used to show how people agreed on particular way of culture and which later took different shaped, both in agriculture and the culture. The good agriculture practices which are being followed in the current era was already identified and well domesticated since ancient centuries. The holistic approach to the plant and human relation in India is as older than Human civilization. The plants were treated like god. They were cultivated with utmost care and emotions. That's why so many festivals, music and celebrations are evolved around agriculture. Economics was not in the minds of Indian farmers for a very long time but still they were very happy for a long time. What existed in Indian farming earlier was harmony with nature, the peace, the contentedness and the joy of life. The micro ecologies unit such as a village or group of villagers was a price of heaven which ultimately the

wise men went to advice now. All the requirement of living being such as food air, good water and the man kind population including the *vaidyas* (Medicinal experts), teachers, warriors, the blacksmith, the goldsmith, the temple (place of solace) constructing architects, industrial men in the process of oil extraction units, the rice flake makers, the puffed rice makers, the artisans, carpenter, the sculptors, musicians, the story narrators, writers, Philosophers, cloth makers, merchants, the hunters, the soldier, the comedians and many more along with domestic animals, the cows, buffaloes, wild animals and birds; they all lived happily with agriculture, animal husbandry continuing to harvest the good yield and using the bi products from it for more than 20, 000 years! Till the so called modern era creeped it.

Brief history of Agriculture across the world

The history of Agriculture accounts starts from the domestication of animals and raising plants including propagation of techniques on raising them efficiently. Agriculture practises commences individualistically in various part across the globe.

- ◆ Emmer wheat, einkorn wheat, hulled barley, peas, lentils, bitter vetch, chick peas, and flax were cultivated in 9500 BC in eastern Mediterranean islands.
- ◆ Rice followed by Mung, Soya and Azuki beans wer cultivated in China by 6200 BC – 5700 BC
- ◆ Pigs followed by sheep were domesticated around 11000 BC in Mesopotamia.

- ◆ In New Guinea area Sugarcane and root vegetables were domesticated in 7000 BC
- ◆ Sorghum was domesticated in the Sahel region of Africa by 5000 BC. In the Andes of South America, the potato was domesticated between 8000 BC and 5000 BC, along with beans, coca, llamas, alpacas, and guinea pigs. Bananas were cultivated and hybridized in the same period in Papua New Guinea.
- ◆ In Mesoamerica, wild teosinte was domesticated to maize by 4000 BC. Cotton was domesticated in Peru by 3600 BC. Camels were domesticated late, perhaps around 3000 BC.

Agriculture in Sumer Civilisation



Sumerian farmers during 8000 BC were growing crops like Barley and wheat. Vegetable crops included chickpeas, lentils, peas, beans, onions, garlic, lettuce, leeks and mustard along with Fruits including dates, grapes, apples, melons, and figs were already being grown during this period. Sumerians also caught fish and hunted fowl and gazelle. The meat of sheep, goats, cows and poultry were

eaten, mainly by the elite. Fish was preserved by drying, salting and smoking.

Agriculture in Indus Valley Civilization



Crops like wheat, Barley and jujube were domesticated during 9000 BC. Cattle, primarily sheep and goats were domesticated in *Mehrgarh* culture by 8000-6000 BC. With the low rainfall the agriculture system depended on river as water source. Irrigation system was developed by around 4500 BC

Agriculture in Ancient China



During 500 BC, a book on land preparation, seeding,

cultivation, orchard management, forestry, and animal husbandry was published. During 100 BC, Chinese were able to innovate hydraulic powered trip hammer which was predominantly utilised to pound, decorticate, and polish grain.

Agriculture in Ancient Greece and Hellenistic World



During 300 BC, in Ancient Greece in Hellenistic Period, crops like wheat, emmer and barley were majorly grown. Vegetable including peas, beans, fava and olives were commonly grown. Nomadic Agriculture and dairy products that came mostly from sheep and goats, and meat were common across Mesopotamia.

For any crop, to be strong both the roots and shoots have to be strong, with such a strong historical background, vedic inspiration, when add the new technology, to obtain both quantity and quality of the food products, we can achieve the **SAFE and FUNCTIONAL AGRICULTURE**.



2

Types of farming and agricultural practices

The method of Agriculture decides the economics of society in terms of quality & quantity of food, food pattern, dressing, the festivals & other social behaviours.

With the existing history, the agriculture system was said to be more strengthened during modern era starting from 19th Century with British Agriculture revolution which covered New agricultural practices like enclosure, mechanization, four-field crop rotation to maintain soil nutrients, and selective breeding was in place to drive the Industrial Revolution.



During 20th Century, Agriculture was further revolutionized with the Self-propelled mechanical harvesters (combines), planters, transplanters and other equipment. The agriculture was been characterized by increased productivity, the substitution of synthetic fertilizers and pesticides.



A series of research and development, along with technology transfer initiatives that took place during 1940's to late 1970's supported in increased production. An initiative led by Norman Borlaug, Green Revolution facilitated the development of high-yielding varieties of cereal grains, expansion of irrigation infrastructure, modernization of management techniques, distribution of hybridized seeds, synthetic fertilizers, and pesticides to farmers.

This method according to us needs to be improved on now, taking to the overall view in health of the people and the climate as the whole.

In India, Rainbow revolution concept with a

combination of Green Revolution, White revolution, Blue Revolution, Yellow Revolution and Brown Revolution supported the increased yield and its quality.

The Indian agriculture slowly shifted from traditional behavior to modern behavior.

- ◆ Green Revolution: Food grain (Cereals, Wheat & Leguminous plant) production
- ◆ White Revolution: Milk/Dairy production (In India - Operation Flood)
- ◆ Blue Revolution: Fish production
- ◆ Yellow Revolution: Oil Seeds production
- ◆ Black Revolution: Petroleum production
- ◆ Brown Revolution: Leather/non-conventional (India)
- ◆ Golden Revolution : Overall Horticulture development/Honey Production
- ◆ Golden Fiber Revolution : Jute Production
- ◆ Grey Revolution: Fertilizer production
- ◆ Pink Revolution: Onion production/Pharmaceutical (India)/Prawn production
- ◆ Red Revolution: Meat & Tomato production
- ◆ Round Revolution: Potato production

- ◆ Silver Fiber Revolution: Cotton production
- ◆ Silver Revolution Egg/Poultry production

Evolution of agriculture practises

The Agriculture started with the domesticated of the selected plants. Selection of the crops, the land to cultivate them and the practises has evolved from different centres of human evolution. So, these were the centres for evolution of culture and agriculture for examples, Agriculture in Sumerian era, Indus civilization, Chinese, Mediterranean, Ancient Greece, Egyptian era, Egyptian era and Hellenistic. The same distinct cultural practises are seen even today.

Nomadic Herding

This practise is based on rearing animals on natural pastures by people of semi-arid and arid regions. People always tend to move from one place to another along with the herds of cattle in search of natural pastures for their livestock. This is also a subsistence type of activity.

The Aryans did not settle into well planned cities of the Harappan culture and instead preferred to clear forests around the river banks of the Gangetic plain and settle in small villages. This could be due to the inherent dislike of a pastoral people to settle in one place for very long, and thus their innate suspicion of any hint of permanence.

Livestock Ranching

This is also very similar to Nomadic Herding with the

major emphasis on animal rearing however here the people or group of farmers are stationed in one area and have a settled live style. This has shown a way forward to commercial livestock farming where large plots of land is available especially in the area of scanty rainfall and low source of irrigation. Here the animals are reared for the biproducts like milk, meat, wool, leather.

Shifting Farming

This is predominantly undertaken in the tropical region across the tribal community to grow more of tubers and root crops. Here, the farmers clear a part of the forest using slash and burn technique and further make the land usable for cultivation till that piece of land is fertile. As the fertility in the soil declines and with occurrence of weeds, farmer shift to other area and start clearing the forest again. The shifting cultivation is almost at the verge of declining due to pressure created by environmentalists and other governance issues.

Subsistence Agriculture

This type of Agriculture is practiced mainly in developing countries. Here, the farmers grow the crop for self-consumption and left over crop would be sold in the local market.

Rudimentary Sedentary Tillage

This is a kind of subsistence Agriculture where the plot is tilled and cultivated continuously year after year. Practises like ploughing, tilling, harrowing and plot

preparation is most commonly observed to retain the fertility of the soil. This is again followed in tropical regions with a mixed cropping system such as plantation tress along with cereal crops.

Intensive Agriculture

This type of farming is noticed in densely populated countries and it involves a great level of commitment to enhance the yield using all possible ways of fallowing. This requires a huge amount of capital along with skilled human resource. However, more than one crop can be raised during a year.

Intensive Subsistence Farming with and without staple crop

Rice being a major staple cereal crop across most of the countries, it is observed that intensive farming is practiced along with cultivation of paddy. It employs and feed a large number of populations. It is very popular in south Asian region. However, due to inadequate rainfall, maize, millet crops or other pulses are grown especially in northern-Southern Africa, Central America and few parts of Middle East.

Extensive Agriculture

This farming is practised in densely populated countries like India, Malaysia and largely in developed countries. This involves heavy machinery while raising only one crop throughout the year.

Modern agriculture a beginning of new era

Increased population and difficulties to meet the demand for food products are commonly observed glitches in developing and under developed countries. To balance the need of self-sufficiency and to meet the demand Agriculture is classified into various types;

Commercial Plantation

The crop like rubber, Areca nut, Cashew nut, Coco nut, coffee, tea, cotton, jute, Sugarcane, cocoa, spices and other fruits which has commercial value and is a source of trading while adding to countries economic status is largely cultivated.

Mediterranean Agriculture

Horticulture being major crop in Mediterranean region, most of the crop is grown in winter season. This type of agriculture includes a combination of livestock and crop rising. Wheat, Vineyards and citrus fruits are major crops.

Dry Land Farming

This is practised in dry and more arid area of the country. As the name itself suggests, the crops such as Jowar, Bajra, peas, which has low requirement of water primarily grown in scanty rainfall area.

Wet Land Farming

Many parts of the world get heavy rainfalls and followed by flooding. Crops like rice, sugarcane, Areca nut

are cultivated in well irrigated areas.

Terrace Farming

The hilly and mountain slopes are cut to form terraces and land is used for agriculture. The problem like soil erosion is checked due to terrace formation in hilly area.

Several new types are agriculture have come up, Horticulture crops (fruits and vegetables) are predominantly grown in these following kinds of farming:

Hydroponics

It is a method of cultivation without soil using the nutrient solutions. The roots of the plant may either be terrestrial or supported by an inert medium such as peat, perlite or gravel. The nutrient solution may be prepared using plants extract, fish waste or manure, any commercial nutrition tonic or commercial fertiliser.

Aquaponics

Aquaponics is a combination of aquaculture, is raising of fish and a cultivation of plants in the same medium. The fish waste is used as a nutrient solution for plants.

Covered or Semi covered agriculture

During the unfavourable weather conditions, and to meet the consumption demand the farming is done in covered or semi covered condition in the controlled poly house or greenhouse systems. The special irrigation system

would be used to meet the water required and the poly/ green housed would be temperature controlled.

Social classification of agriculture

These different types of Agriculture got a change in mankind's life. The nomadic lifestyle was changed to sedentary. People started practising agriculture as one of the main occupations.

Agriculture and its allied business is now of the major source of the GDP of the country. Based on different social structure, agriculture is classified in to:

Individual Farmers/Producer

Here, basic economic unit is a farmer himself.

Co-operative Farming

This is a joint agriculture practise by a group of farmers with voluntary interest. In this, farmers upon the self-interest, pool the various resources. The income is dispersed according to the share of land, human resource and capital investment.

Corporate Farming

It is a business based on agriculture projects. This is a closed system to produce crops, be it agriculture or horticulture produce under the contract agreement between producers/ supplier / buyers. This is mostly done in large scale area. This requires a commitment of the producer and seller of a certain type of agriculture produce at a specific

time period and quantity.

Capitalistic Farming

Here, big capitalist invests on the land acquiring, farming activity, they employ people by paying wages, heavy machineries are hired to get the intensive farming done. Both Profit and loss is borne by the investor or the capitalist.

State Farming

This farming is undertaken by the government. The Government engages the farm supervisors / managers to carry out end to end operations. The financial aid and other facilities including the policy adaptation are given and specified by the government. The complete share of profit is owned by government.

Collective Farming

A group of farmers donate the land, livestock and form the society. The members elect the committee responsible to manage the farming activity which includes work allocation, distribution of income and marketing of surplus.

Integrated Farming:

It is a most dynamic approach which is being applied to any farming across the world to increase the productivity. It means to integrate crop production with livestock management which in turn complement each other in a most

symbiotic way which is more profitable, environmentally stable.

Produce practises

While we understand the different types of Agriculture, now it is important to know more about the produce practises which is most commonly known as package of practises.

Shunam suphala vikrishantu bhumim shunam kinasha abhiyatu vahaih. Shunasira havisha toshmana supippala oshadhih kartanasme means “Let the ploughshares turn up the plough-land in happiness and let the hard-working ploughers go with the oxen in happiness. Air and sun nourishing the earth with water, strengthens our plants bear abundant fruit”

Following of land, tillage and harrowing are the basic practises of breaking the lumps of soil with tools like plough, harrow to prepare for raising crops (sowing or planting), nutrient integration and pest control. Loosening of the soil in addition of soil warming, adding fertilizers and controlling pest infestation may favour the farmer by improving the productivity. However, this may also lead to top soil erosion, reduction in abundance and diversity of soil microbes, soil pollution by releasing more carbon dioxide.

Once the land preparation is done, crop management is an important aspect of agriculture and it is a key factor to increase crop production. Pest & weed control includes management of unwanted, undesired plants (weeds) and

disease causing & spreading insects/mites. There are several chemicals (pesticides / organic based molecule), biological (Bio control – Integrated Pest Management), Mechanical (mechanised weeders) and other cultural practices including mixed or inter cropping, border crop/ trap crop, crop rotation.

Nutrient management comprises both the source of inputs application for crop and livestock production and the methodology of utilization of the source. The nutrient inputs may be chemicals (organic and inorganic fertilizers), manure and compost. Crop nutrition can be again be managed by cultural practises like crop rotation, rotational grazing and application of tonics.

Water Management is a third important part of agriculture. Water Management is required especially in the area where there is insufficient/scanty rainfall and lack of rain water storage facility. Irrigation is the source of water to supplement the rainfall to crops and animals.

With these practices, Farming can be defined as a system with inputs, processes and output.

- ◆ Input are the features that is required to function/ perform: Capital investment, skilled human resource, soil, climate, input application
- ◆ Processes are the action to be performed that make the input to turn into output: Sowing, Planting, ploughing, spraying, harvesting, raising, shearing, milking

- ◆ Output are the finished end products: Food grains, milk, eggs, wool, meat, fibre, hay, fodder

Cultural Practice of Agriculture

Starting from pre -Vedic period, the idea of rotating the crop between the two crops enlightens the approach of cultivating legume between the grain. In modern era it is scientifically supported that legumes do the nitrogen fixation in the soil. Cultivation of the third crop is mentioned in *Koutaliya`s ArthaShastra*.

Crop Rotation

It is a cultural practice of growing series of dissimilar or different types of crops in the same area in sequenced seasons to protect the nutrient content and basic physical characters of soil. It helps in avoiding top soil erosion and increase in soil fertility which helps in growing cereal crops and pulse or fodder on rotation basis based on availability of water source.

Intercropping

It is a multiple cropping practice involved in cultivation of more than two crops in the proximity. The major objective is to achieve greater yield and to utilise the space between two crops. Neither the duration nor the harvested time is a key affecting factor in intercropping.

Mixed cropping

It is a form of poly culture where two or more crops or

grown in the same piece of land. The slight difference between the intercropping is, here all the crops are given equal importance unless the intercropping. All crops are almost of the same duration.

The different types of farming across the world are followed to obtain a qualitative yield using good agriculture practices.

New age agricultural practices

In the effort to meet the food demand, people used various methods. The journey of this evolutionary process is continuous. In this process, people observed pros and cons of different methods. The whole aim is to achieve the sufficient and proper food for consumption. People have coined different terminologies and process of cultivation, but the ultimate goal seems to be the same.

Zero Budget Natural Farming

It is a farming practice that believes in natural growth of crops without adding any fertilizers and pesticides. The inputs are made of locally available in the form of cow dung and cow urine. Zero budget referred to the zero input cost of production of all crops by harnessing the available nutrient in soil. It is chiefly rain fed cultivation. As the input cost is low, this helps farmer increase the income and profitability.

Orientation of farming

Organic and conventional type of farming are the two orientation of agriculture. The fundamental difference of

two competing paradigms of agriculture is based on economic and ecological orientations. Green manuring process is not new technology instead it is being followed since *Atharvavedic* period.

Synthetic fertilizers are used in conventional agriculture. Weeds are controlled by weedicides. Pesticides and fungicides are used to control pest and diseases. Intensive irrigation is required. The negative impact is; products outputs (Consumables) obtained using this conventional farming might have residual effect, chemical residues accumulated on it which may in turn cause several health problems including cancer.

Non synthetic fertilizers are used in organic agriculture. Weeds are removed manually or by weeder (machineries like Kono weeder). Pests and diseases are controlled using integrated pest & disease management. Nutrients are supplied using organic plant growth regulators. The positive impact is that there is no environmental pollution and no side effect on the health due to toxic molecules.

This helps in productions of higher nutritional and qualitative food. It works with natural ecosystem and helps in maintaining the soil fertility.

Due to key factors like soil, climatic features of the selected area, availability of resources – land, labour and capital, major challenges like fragmented land holding and urbanization, there is a need for new orientation of farming.

Need for safe & functional agriculture

Gandhadvaaram duraadharsham nityapushtam karishineem, Eshvareem sarva-bhutanam tvami-hupahvaye sriyam Gandham samarpayami it means there is no seedlings without manure, without the seedling there is no crop. So, manure is the only byproduct used without which is the no propagation of plant or cropping system.

By now organic farming should have been the consistently followed by all the farmers due to its umpteen advantages.

Organic Agriculture has many benefits;

- ◆ Consumer Benefits : Non Toxic, food tastes better and keeping quality improves
- ◆ Grower benefits: Healthy crop in balanced soil condition, pest and disease resistant crop, higher weed competitiveness, lower input cost.

It is proven in many countries that, crops cultivated in organic method, without the usage of chemical inputs to avoid unwanted weed, pest and diseases, will contain higher nutritional value, and because it nurtures the soil microbes facilitates plant accessing the nutrient in a great way. The produce is non-toxic, free of contamination.

Along with the food produced being Safe and Toxin free, the entire agriculture process needs to be more vibrant with high yield for food security. There is a need for world's farmer to feed billions of populations so we need to have

increase in the agriculture production, the way forward is to increase yield while creating toxin free food and to protect the mother earth for our future generations. The food security without the alteration in food safety can be achieved through **SAFE and FUNCTIONAL agriculture.**



3

Safe and Functional Agriculture – A holistic platform to Agriculture

It's understood that organically grown produce not only can be stored for a longer time due to the superior structural and metabolic integrity of the cells but also tastes better.

In spite of having several advantages, there are many hiccups in cultivation process and productivity. There are many constraints like lack of support from policy makers and shortage of skilled labour. Chemical fertilizers and pesticides are more attractive, offering more immediate returns than organic farming. Hence there is a need for most robust process and knowledge about the technique which can serve the safe food to people.

There is a need to increase the food production to keep up the pace of increase in population, lest there be impoverishment.

What is the validity of Organic farming? Plant absorbs the nutrients (Micro and Macro) in the ionic form. Hence the term "Organic" is questionable. There is

absolutely no doubt that people want to attain better food for consumption. Achieving both qualitative and quantitative diet to feed the present population of world can be retained only by **Safe and Functional Agriculture**.

Even, we are in complete disagreement with the use of red labelled pesticides, insecticides, fungicides and other harmful chemicals in Agriculture system. However, we find absolutely no reason as why Safe molecules, green labelled Fungicides, Pesticides and other chemically and scientifically developed micro and macro nutrients to be avoided only with the reasons that the binding is done in factory, artificially. The only very idea that these molecules hailing from factories can be toxic is highly not acceptable. The acceptability can be validated from time to time based on the new technology evolution.

To achieve the required quantity of production with the desired quality depends on the inorganic molecules cannot be undetermined.

Here, the whole purpose of all the entire community of intellectuals across the world is to eat Safe and Functional Food. We don't find any reason to take support of any other word other than Safe and Functional. It is an approach, a methodology and a type of Agriculture. Thats why the word **“Safe and Functional Agriculture”**.

What does safe means, it does not contain any toxic molecules that it is not supposed to contain and functional means it contains what it is supposed to contain in desired proportion. Hereby, the meaning of

the term Safe and Functional is available in the term itself without any confusion or jargons and there is no need for an elaborate definition.

The concept of Safe and Functional Agriculture is straight and simple. Here we would like to quote the famous saying by Steve Jobs “Simplicity is the highest form of sophistication”. We strongly believe by following Safe and Functional approach across the world, Food Safety and sufficiency can be achieved. We can feed the entire living beings by combating the hidden and apparent hunger of the world.

Safe and Functional Agriculture is a novel transformation to the farmers and the future of agriculture.

Although agriculture is the backbone of the nation, but on the other hand, factors influencing the yield like natural catastrophes, soil problem, weed pressure, disease and pest infestation, skilled labour management and other socio-economic factors like lack of technical expertise about the crop, insufficient credits, dearth of information about the usage of plant nutrient tonic and fertilization, low market price and in turn low return which directly marks the profit maximization approach.

Now, the time has come to ensure better future for farmers' community by promoting the next generations of ranchers with Safe, functional and vibrant techniques of agriculture.

Safe, toxin free food; functional, safe for consumption; vibrant, high yielding for food security is the future of agriculture. It is now important to bring a transformation in Agriculture Research & Development to create the state of the art methods that energize the agriculture without causing any harm to the soil composition or to the living being. Many Plant-traits specific patented formulations are manufactured which are toxics chemical free plant nutrition which boosts immunity and resolve disease deficiency. The technique helps in targeting and resolving the crop specific or trait specific problems with accuracy in turn helping the farmers' community to reap the better yield with utmost quality without having any negative chemical influence on the environment or to the living being.

To retain our agriculture economy robust, it is imperative that we need to facilitate the transfer of skills, knowledge about the best practices on soil, climate and vegetation plus understanding about the consumer's demand / supply and more profitability by growing the relevant crop and recognizing the suitable market for selling his produce in turn making profits.

“*Yad bhavam thad bhavathi*”. Things happen the way we think. Let's think to make the world the safe place to eat. Safe and Functional food is the fundamental need for every living being. Agriculture, being beginning of the food chain, the safety of the food begins here with passion to make the entire world population healthier. Social responsibility is the natural ingredients of our every product.

The safe and functional way of agriculture was

conceptualized way back in the year 2000, by me and served through High Tech Agriculm Pvt. Ltd. We have worked on a revolutionary mode in creating a highly successful plant specific and patented formulation which is survived through brand “*Dr.Hegde*”. These formulations (Nutrition tonic for plants) are proven to be superior in quality and outcome consistently over years being used in over 19 countries. We are been dedicatedly working in Agriculture, Research and Development to create the state of art methods that energies Agriculture without causing harm to the soil and mankind.

Practise of Safe and Functional Agriculture

As mentioned earlier there are many efforts since the ester days to make agriculture process more vibrant. *Om, aum, dham, dheem, dhoom, dha* means in olden days during the vedic period it was strongly believed that this sloka if written with the wax solution & tied around the plant would avoid the infestation caused by the insects, pest and other microbial disease to plant.

Apart from regular crop integrated nutrition and pest management with the process of crop rotation and manuring with the animal manures application of green manure was already in place which was a part of Safe agriculture. Pieces of wood of *Terminalia arjuna*, husk of barley and blossoms of sesame are recommended for removal of defilements from arable lands. This was described by *Varahamihira*.

Seed treatment method with the use of clarified butter and honey as pre sowing treatments in in *Atharva veda*. Application of fertilizers is mentioned in *grhyaritual*.

In the fourth *anuvaka* of *Chamakam* in *Rigveda*, it is mentioned that God has created hunger, thirst equally in all living organisms. Except human being, for rest all living creatures god is offering the food to survive hence they need not put their thought on food production however for human being god has gifted the mechanism of cultivation of food through a process of Agriculture (*Krisi Seva*). Importantly, the human beings are blessed with the support of Water, Land, sunlight and other animal including the microorganisms. There is no existence or survival without food. Hence, it is very important that cultivation process has to be good and human being has no right to take things of granted and mismanage the god's gift.

In fifth *anuvaka* of *Chamakam* it is mentioned as *Ashmaa cha me mrittikaa cha me girayashcha me, parvataashcha me sikataashcha me vanaspatayashcha me, hiranyam cha me ayashcha me siisam cha me, trapushcha me shyaamam cha me loham cha me, agnishcha ma aapashcha me viirudhashcha ma oshhadhayashcha me*, It means Let Lord grant me stone, earth spectrum of mountain ranges, basins of river waters, hillocks, sands, Medicinal herbs, tall and fruit bearing trees, gold, silver, lead, tin, steel, bronze and copper. Be blessed with fire, water, creepers, fine foliage everlasting green vegetation, cultivable products, and stray growth millets, and sacrificial animals wild and domestic, wealth ancestral and acquired, progeny and property under acquisition, all worldly benefits, and accompanying advantages, hard earned income and valued belongings minor and major, cosy and comfortable dwellings and abode to my progeny and the capability to

perform sacred rituals and sacrificial rites such as yajnas perfectly and very successfully and enjoying the fruits thereof, assuring harmony, happiness and prosperity achieving my desired objects and finally attaining the goal of liberation.

Comprehensively, it means stone is very important and is a basic need starting from constructing of house, agriculture (potting), fencing till diamond merchants. Soil is very vital. It has all kind of nutrients and metals. The rivers source or irrigation takes birth in mountain valleys and flows through the steep hills and accumulate all the nutrients from the sand. A mention of type of conifers tree / woody plants are made available in this *anuvaka* which are non-flowering plants instead directly bears fruits. The peepal tree is one such example which is used as medicine against several diseases works as a natural air purifier. Metals like gold, silver, Iron are required for growth and development. Iron is an important micronutrient for Plants and Human beings. Any lack of these basic ingredients in the form of micro-macro nutrients can be fulfilled in the form of nutraceuticals (nutrient tonics), primer, Probiotics.

Nutrition management

Firstly, it is suggested to study the soil, understand the soil by analysing the soil reaction, electric conductivity, available macro and micro nutrient and organic carbon. This would avoid the excessive application of fertilizers without knowing the existing level and actual requirement. Farmers may end up either applying too much or too little. It is very important to supplement with ideal fertilizer for optimum

growth of plants and maintain the health of soil

The quantity and availability of plant nutrients elements tend to alter upon cultivating the crop and its harvesting process along with few other natural problems like soil erosion and leaching.

Application of fertilizer is important based on the soil health report. Post understanding the exact requirement of nutrition, it is mandatory to apply, fertilizers which are safe, non-toxic may be organic or inorganic, but the ingredients need to be eco-friendly. Many water-soluble fertilizers, micro nutrients mixture and neem coated fertilizers are available in the market which can be used to supplement the required amount of fertilizers.

These fertilizers can be applied directly to soil or using spraying solution/ drip using fertigation tanks.

Apart from fertilizers, it is essential to provide growth regulators which are a combination of amino acid, humic acid and fulvic acid in a balanced pH. These growth promoters help the plant and animals to fight against the abiotic stress (drought), make the plant more athletic to fight against the diseases and correct the nutrient deficiency problems. It also enhances the food colour, quality and its quantity including the shelf life of the produce.

However, the raw materials that are used to prepare the growth regulator molecules / mixture need not be sourced from animal dung/ urine or any compost. These can be prepared using plant extracts/ derivatives and sea weeds and blended well in factories.

With the spraying of these plant regulators along with the application of fertilizers a good qualitative and quantitative yield is obtained.

A mixture of help meal, amino Acids and silica based plant derivatives need to be added to soil and mixed well. This will help in correction in the soil reactions (pH)and electric conductivity.

Animal Husbandry is an integral part of safe and functional Agriculture:

Animal Husbandry along with cultivation of crops became very popular for carrying loads of food, for protecting agricultural produce and for productive agriculture operations. The Rigveda focusses on domestication of animals like cattle, horse, sheep and goat. Dogis also mentioned in this text as a draught animal for protection and alerting. Breeding, rearing and tendingas different components of domestication of animals are discussed in the Vedictexts. Maintenance of the soil health is very vital to maintain the sustainability of soil for many generations. To maintain the soil health, managing the organic matter or organic carbon in specific, soil texture, soil structure, beneficial micro fauna and flora water holding capacity is possible by having animal husbandry which is an integral part of Safe and functional agriculture.

Agriculture without Animal Husbandry is short leaved. Among the different animal raised by humans for agricultural and its allied activities, cow is the most important animal which will add enormous benefits to

Agricultural ecosystems. The biproducts of rearing the cow for agriculture and human life in India is well established even before thousands of years.

Animal husbandry along with agriculture is followed since pre-vedic period. Cattle rearing were an important activity from agriculture point of view. It was a source of food, labour and wealth. In modern days, Animal husbandry is treated as a branch of agriculture which deals with rearing and management of cattle and other domestic animals. This predominantly deals with feeding, breeding and health management of the livestock to obtain the maximum economic advantages. Animal husbandry these days also includes poultry farming and fisheries.

A mention of cattle rearing is available in *Arthashastra*. As regards persons involved in cattle rearing, there are references to *Paśupa*, *Gopa* (herdsman), *Godhuh*, *Dogdhmān* (milkman) etc., which shows cattle tending was practiced as a major profession since the pre-Vedic period. During the epic period also, cattle was treated as principal wealth. There were numerous occasions when myriads of cows were given away as gifts to supplicants in *Ramayanas*. *Mahābhārata* also made genuine references to cattle wealth. The text speaks of various types of wild and domestic animals such as cow, goats, sheep, horse, mule and ass.

The cattle were used for land preparation for ploughing, transporting of goods and military functions. It is a source of dairy products like milk, yoghurt, cheese, butter etc. The livestock produce a wide range of fibres. Wool is produced by sheep and goat.

Disease management

Since many generations, with the support of research and development, the farmers are evolving their practices for combating the various plagues suffered by the crops. With reference to the traditional principles articulated by H.H Whetzel in 1929 to control plant diseases are the four important principles:

- ◆ Avoidance—prevents disease by selecting a time of the year or a site where there is no inoculum or where the environment is not favourable for infection.
- ◆ Exclusion—prevents the introduction of inoculum.
- ◆ Eradication—eliminates, destroy, or inactivate the inoculum.
- ◆ Protection—prevents infection by means of a toxicant or some other barrier to infection.
- ◆ Resistance—utilize cultivars that are resistant to or tolerant of infection.
- ◆ Therapy—cures plants that are already infected.

Having these principles in focus, it is imperative to think in large sense as plant disease management than plant disease control. A disease resistance sprays are equally important as like the application of fertilizer.

Some of the major diseases caused by fungal infection like seed borne disease, fruit dropping; wilting can be cured with the preventive measures.

The seed treatment with non-toxic molecules can bring down the incidence of seed infection.

Case study as mentioned by H.H Whitzel: Several important pathogens of dry beans, including *Pseudomonas syringae* pv. *phaseolicola* (the causal agent of halo blight), *Xanthomonas phaseoli* (the common blight pathogen), and *Colletotrichum lagenarium* (the fungus responsible for anthracnose) are seedborne. Recommendations for the control of these diseases, therefore, always include the reduction of seed infection through some kind of "clean seed" program.

The seed for most of the dry bean production in the United States is grown in the semi-arid areas of the Pacific Northwest, where there is very little development of these important seedborne pathogens. In most years the seed produced in these areas has a vanishingly low incidence of seed infection

Similarly, we (Dr Hedge `s formulation) have fought against the one of the major diseases, Fruit dropping caused by *Phytophthora* fungi in Areca and being completely controlled by the our *Dr. Hedge* branded product Bio-fight and Bio-fight Plus. The spray should be undertaken before the onset of monsoon.

Pest Management

The crop being affected due to rats & rodents (*vyadvaras* & *aakhu*), borers (*taarda*), insects (*upakvasa*) and insects (*samanka*) was already known since vedic

period. The solution was also sought for pest and weeds in *Arthavaveda*.

Pests and other infection causing insects like flies, thrips, borers, mites, aphids, scales, white flies can be controlled using proper Integrated Pest Management and application of innovative eco-friendly, non-toxic organic extracts works as pest repellent and insecticide.

The pest repellent should be multi-dimensional and multi-organism; the product should be shielded from the tolerance developments for pests instead of usage of toxic pesticides.

Further research required

A detail research needs to be done in the area of total biodiversity benefits as compared to conventional type farming and other organic farming. The impact of Safe and Functional approach needs to be studied and extended to aqua culture. The state and importance of agricultural genetic diversity need to be studied.



4

Success Stories of Safe and Functional Agriculture.

Safe and Functional Agriculture is a technology, methodology and a vibrant process by itself using which the mankind is served with Safe – Non – Toxic and Functional-Eco friendly food over many generations. As mentioned previously, Safe and Functional approach is the future of Agriculture.

High Tech Agriculum Pvt. Ltd. is a pioneer in manufacturing of Safe and Functional plant nutrient with the main objective of increasing the yield and quality of the crops cultivated with nontoxic input molecules which are in turn very safe of consumption. We develop eco-friendly and non-toxic plant food range of products which increases the yield anywhere from 18% to 82% depending on the crops and plantations. Our products have patronage in about 19 countries across the world - Asia, Middle East, Africa, Europe, Australia, South America and still fast expanding.

Our vision is to increase the productivity of all the crops ensuring Safe and Functional foods. We manufacture value-added products to address each of the demand areas,

reduce losses to the environment, increase yield of crops, and provide an economic benefit to the farmers.

With the true inspiration from our *vedas* and *puranas*, our mission is to provide nutrients when plants need most, thus optimizing utilization and plant performance, thereby increasing the plant productivity per acre. Our business philosophy is to ensure food security to all along with providing food safety in a non- toxic eco-friendly environment.

The main motto of High Tech Agriculum Pvt. Ltd. is to provide a Safe and Functional food supplement for all the crops and in turn to the mankind, other living being and to the Mother Earth. High Tech Agriculum adopted a unique approach to plant management, soil management, disease management and pesticide management, to create a proven, time tested healthy crop growth throughout the year. Our products are clearly scientific improvement over organic products, thereby increasing the productivity and reducing the input costs per acre.

High Tech Agriculum Pvt. Ltd. is an innovator of Safe and Functional way which is a pathway for Sustainable Agriculture. We have developed more than fifty products relevant to a wide range of diverse crops. We are offering a multiple nutrient solution to the farming community across the globe, which are Crop Specific and trait specific. We have a unique product in the form of granules, liquid and tablets for soil conditioning, Nutrient and disease resistance and making the plant more tolerant against unfavourable conditions. We classify the plants food supplement.

- ◆ Plant Nutraceuticals
- ◆ Plant Probiotics
- ◆ Plant Primers
- ◆ Spray Adjuvants
- ◆ Inputs for High Value Forestry
- ◆ Garden Management

Plant Nutraceuticals

A standard formulation with natural, eco-friendly compounds which act as a dietary supplement and food additives. These products help in reducing the biotic / abiotic stress and prevention of disease and in turn improving the yield and it`s quality. It is further classified as

- ◆ Crop specific formulations
- ◆ Nutrition Management

Crop Specific Formulation: A special organic liquids/ tablet for different crops.

Plant Tonic: These are a mixture of plant derivatives in the most balanced and easily available form. These tonics boost the growth of the plants.

Water Soluble Fertilizer : High Tech Agriculum has developed wide range of high-performance water soluble fertilizers for soil application.

Micronutrients mixture : Micronutrients are the essential elements which are required by plants in very small amounts. These helps in promoting plant metabolic activities and growth of the plants.

Plant Probiotics

It is a signal of introducing non-harmful microorganisms in to our bodies to keep the “bad bacteria” away. Probiotics assist in retaining the balance by introducing non-harmful bacteria to our bodies, making it difficult for bad bacteria to extra colonize and lead to imbalance. Health of the soil in Agriculture is very similar to human health.

Microorganisms like nitrogen fixing bacteria and mycorrhizae play a very vital role in plant health. Mycorrhizae help in increasing the root density and in turn intensify the water uptake capacity. The unused nitrogen available in soil is converted into usable form, nitrate form for the plant by nitrogen fixing bacteria. In case of increase in the population of bad microorganisms, the health of the plants deteriorates and potentially dies off.

Plants probiotics play a vital role in strengthening this nitrogen fixing bacteria and mycorrhizae microorganism population which is immensely required for plant wellness.

Plant Probiotics is further classified into:

- ◆ Crop Specific Granules
- ◆ Yield Enhancing Tablets

◆ Soil Conditioners

Crop Specific granules: A unique formulation in the form of granules which are specific to each of the agricultural crop.

Yield Enhancing Tablets: An exclusive product in the form of Tablet which can be used directly to the soil mixed in fertilization and supplied as spray or in drip.

Soil Conditioners: An excellent product which is to be applied and mixed with soil to improve plant growth and health. These soil conditioners help in correcting the soil deficiencies.

Plant Primers

It is a product containing the complex mixture of compound which can be predominantly used in preventive coating in case of disease or pest infestation.

It is further classified as:

- ◆ Disease Management
- ◆ Insect Management

Disease management: Products for reducing the economic damage caused by the host, pathogen and the environment.

Insect Management: This is a system of reducing the level of infestation of the pest which directly affect the yield and it's quality.

Spray Adjuvant

This product is added along with the plant nutraceuticals spray. This helps the nutraceuticals spray in delivery and placement instead of any drift caused due to air. This makes the spray to adhere to the plant.

High Value Forestry

Apart from production of yield in terms of food, we have imparted our research intellectual for enormous wealth in less time. High Value forestry mainly consists of woody plants which are very vital due to their valuable timber. This can be improved with the inputs of High Tech Agriculture. The products are available for Sandalwood, Melia Dubia and Teak.

Garden Management

Gardening is the art that uses flowers & Plants as paint and soil and sky as Canvas. Landscaping & gardening is a most cost-effective tool for progressing and endorsing the lifestyle aspects, be in with the city, suburbs or the country. Gardening takes place in non-residential green areas, such as parks, public or semi-public gardens (botanical gardens or zoological gardens), amusement parks, along transportation corridors, and around tourist attractions and hotels. The fabric of historic gardens and landscapes is threatened by pests, diseases and invasive plant species. These growing threats are the result of increased global trade as well as climate change and are introduced via infected plant material or human transfer, or

are spread naturally, for example by wind, water or wildlife.

These gardens can now be managed well with Safe and Functional way by using “All in one nursery and home garden kit” for home gardens and small scale nursery which contain plant tonic and pest controlling safe formulations.

Super Raju - User friendly mobile application for farmers

In order to help the farmers' is we are in the process of introducing a downloadable, user friendly, MOBILE APPLICATION - SUPER RAJU which has all information needed for the Agrarian community.

SUPER RAJU has crop list, our various products descriptions, how to use them, dosages, methods of using and this includes Cereals, Vegetable and Horticulture including perennial crops. It also provides solution for various kind of information for soil – usage of nutrition, various pest attacks depending on the season and also pest control management techniques. It sends notification to farmer based on the sowing date on the specific application to be undertaken for crop protection.



Dr. Hegde's

Safe & Functional

Sweet Farming

Better Yield Out in Field

Sugary

HIGHTECH AGRICULTURAL INPUT LTD.

Dr. Hegde's

Safe & Functional



**HAPPY TO BE SATISFIED
HELPING FARMERS REALISE
THEIR SWEAT**



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**HAPPY FLOWERING
ADDING GRACE & POISE TO
FARMING**



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Dr. Hegde's

Safe & Functional

AARIF

REINVENTING PROGRESSIVE & VIABLE FARMING

My life begins & ends in our 3.5 acres of Papaya farm. It's my blessing we started using Dr. Hegde's range of plant food. I must confess our plant growth & crop is very good Quality, healthy & more yield. Today, farmers come over to take my advice about usage of plant food & likes!



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Dr. Hegde's

Safe & Functional

JAMMALDINNI

PRECISION FARMING, THE ONLY HOPE FOR FARMERS

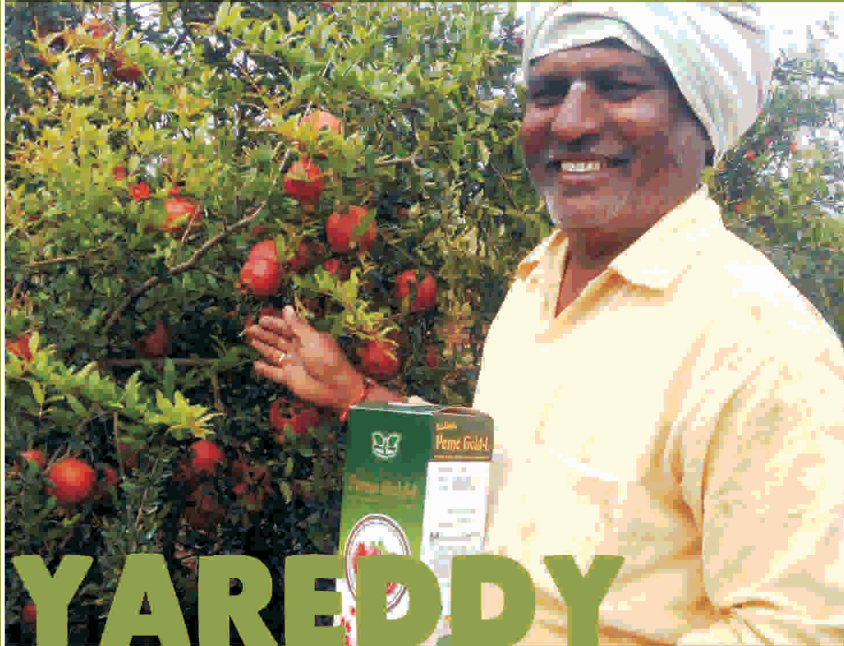
Its over 20 years since I've started farming our 25 acres of Grapes & 20 acres of Sugarcane. If I say our lives are far better today is because all my children are inline with higher education & our association with Dr. Hegde's range of products. Rest assured our future is in safe hands!



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Dr. Hegde's

Safe & Functional



YAREDDY

SMART FARMING, THE FUTURE OF AGRICULTURE

Our 30 acres of Pomegranate farm is more like a member of the family. Thanks to Dr. Hegde's Pome Gold our plants are the fittest lot in the vicinity & our yield is better than the perfect, also surprisingly has a longer shelf life. My advice is must sought after & also an source of inspiration.



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Dr. Hegde's

Safe & Functional



FIGHTING THE FRUIT ROT WITH SAFE & FUNCTIONAL FARMING ITS MERRY BERRY

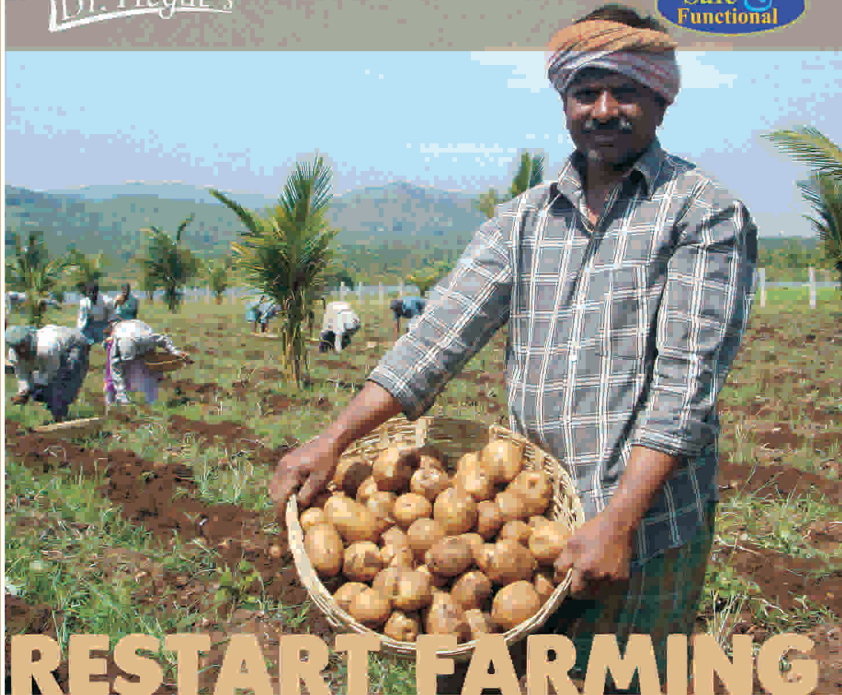


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**RESTART FARMING
PLANT MEDICINE THAT
BOOSTS THE YIELD**




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5

Food Safety and security

In our Upanishads, it is mentioned as Food is divine, it is identified with matter. Food is that which feeds and sustains individuality.

As per our *Vedas* in *Chamakam* fourth *anuvaka*, *Urkcha me suunrita cha me payashcha me, rasashcha me ghritam cha me madhu cha me, sagdhischa me sapiitishcha me krishhischa me, vrishhtishcha me jaitram cha ma audbhidyam cha me, rayishcha me raayashcha me pushhtam cha me, pushhtishcha me vibhu cha me prabhu cha me, bahu cha me bhuyashcha me puurnam cha me, puurnataram cha me akshitishcha me kuuyavaashcha me, annam cha meakshuchcha me vrihiyashcha me*, which means Let me be granted food, good reception, hospitality, milk, tasty sweet bountiful juices, ghee, honey and blessed with participating at food, drinking with others company, abundant agricultural activities, sumptuous rains, Virgin cultivable fertile lands; with lushy tall sky high green trees and foliage, flower beds, gold, and costly and rare *navaratna* stones; blessed with great grandchildren with a pleasant

feeling of possession and oneness and complete security and protection, with a well built and nourished and maintained body, with teaming cereals, millets, pulses profusely available and proliferating, ever on the increase, devoid of hunger by consuming them perpetually with complete satisfaction.

Food Safety refers to handling, preparing and storing of food in a way to best reduce the risk of mankind becoming sick from food borne illness. The principles of food safety aim to prevent food from becoming contaminated and causing food poisoning. The harmful chemicals used for cultivating of crops may lead to consumption of harmful and contaminated food.

Food security is a state of adequate supply of food to all individuals and access to it. Food security means availability, accessibility and affordability of food to all people at all times.

Food safety and security is achieved in a country only if enough safe, free from harmful chemicals, food is available to people all the time. All people should be able to buy these safe foods in other terms these safe foods should be affordable so that all persons have the capacity to buy food of these safe grade without having any barrier in accessibility.

The focus of Safe and Functional Agriculture is to make higher productivity of all the crops ensuring Safe foods to all human beings and animals. As the food chain starts with the Agriculture, we believe there is an urgent need to keep the toxic molecules out of the agricultural system.

With five thousand years of civilization to our credit, we are yet to standardize the safe and functional fuel (food) to our biological machine (human body). We are proud to dedicate our-self for this noble cause of creating healthy and wealthy human resource in this beautiful green planet, the Earth. Our expertise is to keep the problems of the plants away from the fields, while the rest are busy in solving the problems.

It is strongly believed that if you can give the plants what you can, plants will give you back what they can. If you give the plants what they need, they will give you back what you need. Let us add some more green to the Mother Nature so as to create better place to live-in for generations to come.

- ◆ Safe: Should be free from toxic molecules
- ◆ Functional: should be rich with nutrients.

The main motto is to provide a Safe and Functional food supplement for all the crops and in turn to the man kind, other living being and to the Mother earth.

The standardization of the food based on the genetic makeup of the people is well established in Ayurveda (*Vatham, Pitta, Kapha*), certain food is prohibited for certain group of people. Apart from these, even among the approved list of the food, its method of usage is very much classified as *Satvik, Rajasik* and *Tamasik* foods for maintaining the desired physical and mental health.

Apart from the production of Safe crops, the standardizing the food consumption based on the genetic

makeup is required to achieve SAFE and FUNCTIONAL AGREECULTURE, an agreement with agriculture. Even though the food may be safe but few people are allergic to certain food items because of their own body nature.

As our goal is to achieve the holistic well-being, we propose to standardize even the consumption in the future days along with quantity that need to be consumed.

A stable agricultural sector ensures food security for the nation. The main requirement of any country is food security. Food security prevents malnourishment that has traditionally been believed to be one of the major problems faced by the developing countries. Most countries rely on agricultural products as well as associated industries for their main source of income.

As per the FAO status update, it is through a mental process that farmers take decisions, based on their own ideas and values, and accepting responsibility and consequences of their choice. It is therefore necessary to place the analysis of agro-ecological, economic, social and institutional parameters within a wide context of goals.

For instance, farmers deriving part of their income from off-farm activities could afford longer crop rotations to enhance environmental quality at the expense of economic performance. A farmer with pressing income and food needs and available working force will opt for more intensive use of land and excess water pumping for food production. An enterprise engaged in crop exports will prefer to purchase organic inputs to maximize its crop monoculture on the

whole farming area, thus foregoing diversified crop production and animal husbandry on the farm.

Specific farming objectives must be set in light of identified needs, opportunities and constraints. It is with a specific objective in mind that farmers decide on what to produce, how much to produce, and how best to produce. Objectives and constraints of stakeholders at the micro-level (e.g. farmer or community) should be integrated with those at the macro-level (e.g. policy, markets) and different types of evaluated trade-offs.



6

Safe and Functional Agriculture – A pathway to achieve sustainable farming

Sustainable Agriculture is a production of food, fibre, or other plant or animal products using recent farming techniques that protect the environment, people health and mankind communities and animal welfare.

Using Safe and Functional Approach, farmers can produce crops and raise animals without usage of expensive toxic molecule and relying on much affordable non-toxic, eco-friendly products. Sustainable farms protect biodiversity and foster the development and maintenance of healthy ecosystems.

Agriculture remains the key sector of any country. Presently agriculture above and beyond farming includes forestry, dairy, fruit cultivation, poultry, bee keeping, mushroom, arbitrary, *etc.* Today, processing, marketing, and distribution of crops and livestock products etc. are all acknowledged as part of current agriculture.

To make a country self-sufficient, there has been intensive use of harmful synthetic chemical for more than

last four decades, which has created several problems linking excessive fertilizer use with environment.

To overcome problems like excessive use of fertilizers, contamination of soil and poor skillset across the farmer community about the organic farming, there is a need for Safe and functional Agriculture to obtain highest importance in sustainable agriculture.

Lot of new molecules which are safe, eco-friendly and non-toxic should be tested in different crops such as legumes, cereals under varying agro climatic zone in different types of soil which help in better nutrition / pest management.

Safe and Functional approach can now be easily applied plan or a pathway for sustainable farming if adequate attention is given in this area. There is an urgent need for more scientist to identify the thrust are of research for development of eco-friendly production technology.

Safe and Functional Approach is to increase the productivity and reducing the input costs per acre. It is a unique approach for plant management, soil management, disease management and pesticide management is essential to create a proven, time tested healthy crop or Plant growth throughout the year.

“Good people go to heaven after they leave here;
Best people create heaven here before they leave”.

-Dr. Nagaraj Hegde