An economic analysis of coconut farming in Karnataka for the sustainable development of agriculture sector

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The coconut is a compassionate crop of mankind. It not only the source of oil seed, beverage, fibers, timber, food and health creations even it related with medicine, mystery, magic along with sign in a energy of citizens for sustainable development in economic aspects. The coconut tree supplies dwellings and tools. It stays the imperative foundation of producing livelihood to an occupant of the coconut farming situations in coastal regions. Presently in agriculture sector, Karnataka state occupied one of the top 5th places for coconut cultivation in all over the nation. Still these days a mystery and omen of coconut imagery emerges in everyday existence of the citizens also this temperament's mainly valuable gift prolong chosen as discovered, logically, artistically as well as economically in the humankind traditions. A utilization models and commands for shriveled coconut manufactured goods have extreme because of ingrained molds of utilization by domestics. Economically, variations in coconut values generate raw substances qualms pro this section of manufacturing, which be geared on the way to North Indian souks. Sometimes desiccated coconut business too undergoes as of scientific differentness. Contemporary driers as well as additional connected tackles have not utilized pro dread of heavy imports and cost. Nonappearance of the consistent deals tax rule has moreover measured with an industry since one of the causes for offensive souk expansion of this worth added manufactured goods in agriculture sector. Moreover coconut farming leads a foremost role for economic core in agriculture sector, especially in Karnataka it plays as one of the most commercial product for several zones. Collectively, the study has framed a couple of objectives; to study the forecast of coconut based cropping system under technical and non-technical views for sustainable development and to identify the varieties of economic based coconut cropping system in agriculture sector. Hence paper carried secondary data, which has been gathered from the published books, articles and literatures on the subject. Thus, the passage revises the economic cored coconut cultivation in Karnataka and its challenges along with several issues of it in an agricultural sector.

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1. Introduction:

As for the economic aspect coconut farming is one of the major commercial farming methods in Karnataka. Conventionally, in a medieval era the coconut has known as Nix indicia, a Indian nut, while a equal stage that has also famed as Nargil tree, 'the tree of life'. Generally, a palm of coconut has belongs and monocotyledon towards an arrange Arecaceae, kin Palmate and a specie has recognized as Cocos nucifera Linn. Fortunately, Karnataka stands second in area but its production is double when compared to Kerala and equals its total production. Thus from production point of view, it stands first in India which basically comes under agriculture sector. In Karnataka it has been recognized / utilized since from Christian era, its cultivation was probably introduced near Badami, from Bombay and it spread all over the plains during Hoysala's reign and later to other parts. Now, it is one of the important established cash agriculture production crops in the state.

Ever while ancient period coconuts has traditionally allied by means of worship as Goddess. Its antiquity in Indian mythology is well established from its mention in Kishkinda khand and Coconut Tree Aranya khand in Valmiki Ramayana. Indications too had been talk about the coconut in Raghuvansha of Kalidasa and Sangama literatures. In its normal structure, coconut beautified by silver or gold formed division of presentations on several spiritual junctures. This cultivation in Karnataka accounts for around 15 percent of area and nearly 10 percent of total production in India. Even this has almost second major as well as imperative horticultural yield in the state. The Karnataka inhabiting around 31 percent of whole region under agriculture and horticultural yield, coconut yield has grown into almost every district of the state. As for Government economic reports the whole region in coconut at the state has about 3.33 lakh hectors as well an annual production of coconut is approximately 1754 million tones. A productivity of coconut in Karnataka is measured as shortest while contrasted to additional neighboring states. Coconut assortments grown in Karnataka has chowghat orange dwarf, Malayan yellow dwarf, Malayan green dwarf, chowghat green dwarf, Malayan orange dwarf and Gangabondam. The dwarf variety is mainly for tender coconut purpose. It has estimated that, nearly 60 percent of a coconut produced in the state has consumed like religious purposes, social cultural and raw nuts for domestic culinary purposes. In the view point of sustainable development, above 25 percent of nuts have rehabilitated keen on dry coconut powder, ripe ball copra and the residual 15 percent has consumed as tender coconut for drinking purpose.

2. Review of literature:

There are many research studies on coconut farming in everywhere, but the brief reviews of these studies are given in the following paragraphs.

Khunt., (2003) in his project on "The economics of coconut production and marketing in Saurashtra of Gujarat State", he revised an economic soundness of investment on mature but orchards was normal as well as in varying situation of cost and returns. Both types of orchards were at price as far as profitability was concerned. The marketing efficiency was lower in mature nut making.

Anil Kumar., (1997) evaluated the coconut farming system under "Cost of Return of Production in Gorakhpur District of Uttar Pradesh" accounted that the average area perform under cultivation. Two varieties Harichal and local were grown in the study area. Which says, the involvement of farmers is essential up to the serration period of farming, otherwise the sustainable outcome of coconut farming might become negative.

Santha., (1993) analyzed the technical utilization and constraints in the maintenance of coconut farming and revealed technology adoption of recommendations in the maintenance of coconut palms. The proper attention of coconut palm through regular cultural practices was very essential to set up and maintain production at high level for an agriculture sector. The main constraints that stood in the way of adoption of most of the technologies were educational and economical in nature.

Aravindakshan., (1991) reported that, lack of irrigation facilities, several indices of diseases like root wilt, salinity of existing palms, inadequate maturing and low genetic potential of existing palms were the falter responsible for poor performances of the coconut farming in agriculture sector.

Castro., (1991) studied the economics of coconut plantation established from nursery and field planting up to bearing under four cultural management practices such as manual cover crop establishment, mechanized covers crop establishment, mechanized manual clear culture establishment. Cost of cultivation was divided in to material labour and other expenses which amounted to Rs. 15,082.5 and the net return was Rs. 45,888.5. Based on the cost and returns analysis, returns to capital is expected between 6 to 7 years from field planting.

Narayana., (1991) conducted a survey on "Coconut Development in Kerala State with Special Reference to Ernakulum District", he found that the area under the coconut cultivation

has been showing a declining trend. The small increase in production of coconut is not sufficient for per capita consumption of nuts because of growth in population. The fluctuation of prices of coconut and coconut oil has been another area of the study in his book.

Nature of land use and cropping system of coconut farming:

Coconut yielding method is a very concentrated form of farming also particular awareness should be paid to dirt richness preservation. This has attained by beginning the methodical water along with organic substance cycle. A coconut farm soil should be subsequently prearranged that the rainwater should be engrossed in the farm itself or store up into suitable storage reservoirs. Wherever water shortage is practiced, amass water in non-porous tanks pro use while scarcity era. Together with appropriate water and soil protection general mulching should be experienced. Ultimately these mulches turn into organic substance to a soil. Particular attempt should be made toward integrate as well as generate as superior organic substance as possible into the soil.

Under economic based cropping system of coconut farming the subsequent approximations gives the idea about an income that can be obtained as of a region of coconut supported yielding system. Viewing the average yield of 200 coconuts per tree, forty coconut trees will yield about 8000 coconuts. Suppose Rs. 4 as sale price, 32000 rupees could be obtained as of coconut only. The value of firewood, leaves, material, fiber, shells etc will be concerning 8 to 10 thousand rupees. This steady income of 40 to 42 thousand rupees can be obtained as of coconuts. Almost equal quantity as of husbandry units, while the cost of production might be supplementary contrasted to coconuts. Conversely, by correct planning expenditures can be condensed. In regular a coconut based cropping method can give a total income of 40, 000, to 80, 000 per acre which is quite high compared to the present averages. Regarding this, table: 01 shows the configuration progress of CPSS / CPES of 2012-13 agriculture year (as on 13-09-2013) for Karnataka in detail.

Table: 01. Configuration progress of CPSs / CPEs – 2012-13 (during 13-09-2013) in Karnataka

Sl No.	Districts	Name of Charge Officer (S/Shri)	Area (ha)	Production (lakh nuts)	Target for CPS (2012-13)	CPS forma-tion process	CPS regd with Reg. of Socts.	Weekly change	CPS Regd with CDB	CPF formation process	CPF Regd with CDB	CPC formation progress	CPC Regd with CDB
1	Tumkur	G.M.S. Swamy	132587	9945.66	341	55	176	40	-	15	4	1	1
2	Hassan	G.M.S. Swamy	61880	3471.67	159	25	4	-	-	5	2	-	-
3	Chitradurga	H.B. Sadashivappa	42563	2915.91	110	20	17	-	1	10	1	1	
4	Chikmagalur	B.N.K. Murthy	37990	1844.78	98	18	-	-	-	3		-	-
5	Mandya	Simi Thomas	22940	1453.48	59	10	-	-	-	6	5	1	
6	Mysore	J.E. Latharani	21977	1938.57	57	10	3			5	1	-	-
7	Uttara Kannada	D.C.K. Shankar	16106	1334.27	41	8	-	-	-	-	-	-	-
8	Udupi	D.C.K. Shankar	15114	1184.16	39	8	-	-	-		1	-	-
9	Ramnagar	Simi Thomas	13861	922.42	36	15	15	-	-	5	8	1	
10	Devangere	H.B. Sadashivappa	12030	824.15	31	6	1	-	-			-	-
11	Chamaraja Nagar	J.E. Latharani	11360	672.42	29	10	-	-	-	5	2	-	-
12	Mangalore	D.C.K. Shankar	-	-	-	10	-	-	-	1	-	-	-
13	Shimoga	B.N.K. Murthy	-	-	-	10	-	-	-	2	1	-	-
Total			388408	26507.49	1000	200	216	40	1	57	25	4	1

Source: Coconut Producers' Societies / Companies (CPC) / Federations (CPF) in Karnataka (aimed pro 2012-13 is 1000 CPS / CPWS)

Under sustainable development an economic challenges of coconut farming:

Under sustainable development an economic challenges of coconut farming in the agriculture sector are as follows:

- Lack of correct advanced direction to cultivate the coconut farming.
- Lack of irrigation / insufficient water resource.
- Emerging problems of viral syndrome diseases.
- Regular disturbance / attacks of animals.
- Fluctuation of marketing prices and rates along with international competitions.
- Lack / insufficient stock lot system.

- Negative impacts of chemical fertilizers and adverse effect of pesticides.
- Nonscientific / outdated farming methods.
- Unsatisfied / untimed loans and subsides.
- Social insecurities and agro educational backwardness.
- Unhealthy competitions among the farmers.
- Migration, brain drain and negligence of agro products.

Forecast of coconut based cropping system for sustainable development:

In the core direction of sustainable development the estimating coconut based yielding method are as follows:

- Fundamental arrangement of coconut based yielding method is structured by planting coconut trees on a space of 33 ft. in a plaza plan. Forty coconut seedlings can be planted in single acre in this design. Within one hectare precisely hundred coconut trees can be planted.
- The plant to plant space can be abridged by 2 or 3 feet depending on hybrid varieties which has canopies of slighter distance. Likewise, alterations might be necessary in gaping depending on the bulk and form of the land one possesses.
- A location of every coconut tree is marked by pegs. The first line of coconut trees will be planted leaving half of the plant to plant distance (16.5') as of the limit. Marking of the position should be made carefully so that the limited soil is best utilized. Equilibrium of area if any should be positioned on one side of the soil and should be used pro producing any suitable crops.
- Pits of 4' x 4' x 4' dimension are dug for each coconut tree. While digging, the peak soil is placed on the deep side of the pit, the center soil on the left side and right side. After digging the pit should be left in the rain and sun to be weathered. It is extremely optional that the pits are dug at the end of rainy season or for the period of winter season and leave those for weathering till the commencement of next rainy period. But one month previous to planting the pits should be filled by a mixture of top soil and well rotten cow dung (1: 1 ratio) up to semi the height.
- Superior quality seedlings of selected variety should be planted in the pit a little over the half stage. Then using the middle and bottom soil a bund is made on the higher face of the pit to prevent runoff water getting accrued in the pit. Where there is difficulty of high

water table or water logging the seedlings are planted on lifted mud heaps or at the stage of a ground.

- Gap filling should be done in the second year in case any of the seedlings die. Make sure that a coconut trees have established and growing appropriately.

3. Objectives:

The main and specific objectives of a study are:

1) To study the forecast of coconut based cropping system under technical and non-technical views for sustainable development.
2) To identify the varieties of economic based coconut cropping system in agriculture sector.

4. Methodology:

The Methodology is very essential to prepare an article. Here quantitative methods has used in the present paper. This paper has carried secondary data that has been gathered from the published sources such as various articles, books, periodicals, literatures, projects and reports on the subject. For the purpose of gathering the latest information on the topic E-sources also consulted.

Varieties of economic based coconut cropping system in agriculture sector:

An existed variety of economic based coconut cropping system in agriculture sector is as follows.

1. Coconut + banana + guava+ pineapple
2. Coconut + fodder grass + lime/lemon
3. Coconut + turmeric/ginger + nutmeg
4. Coconut + horse gram + areca nut with tapioca
5. Coconut + pineapple + cloves + yam
6. Coconut + fodder grass + custard apple
7. Coconut + turmeric/ginger/yam + cocoa
8. Coconut + Jowar/ragi/bajra/maize + soyabean +sunflower +pomegranate

9. Coconut + pineapple + papaya
10. Coconut + medicinal plant + areca nut
11. Coconut + upland paddy + banana
12. Coconut + perennial fallow legume (stylo) + dairy + perennial fodder grass
13. Coconut + rabbits or goats + subabul (fodder)
14. Coconut + casuarinas (firewood/poles)
15. Coconut + sericulture
16. Coconut + timber trees (teak)
17. Coconut + papaya + drumstick trees + goats or rabbits + fodder legume
18. Coconut + papaya + banana + pigs + pineapple or tapioca
19. Coconut + turmeric + neem trees + coriander
20. Coconut + banana + sugarcane
21. Coconut + subabul of' drumstick trees + nursery for fruit trees or non fruit trees
22. Coconut + fish culture + wet paddy
23. Coconut + coffee + yam + rubber

5. Issues and Findings:

The optimal issues as well as general findings are as follows.

- In one hectare precisely the hundred coconut trees can be planted under the space 2 or 3 feet as depending on hybrid varieties which has canopies of slighter distance in karnataka.
- Significantly, in Karnataka state the coconut farming has more than 20 existed variety of economic based cropping system in agriculture sector.

6. Suggestions:

The optimal suggestions for the coconut farming for a sustainable development of agriculture sector are as follows:

- Kindly provide the sufficient loans and subsidies for the farmers under require time.
- Educate the farmers about the every cycle and maintenance on coconut farming.
- Encourage and support the farmer achievers.
- Respond the farmer demands and requirements as well as avoid the farmer suicide.

- Offer the trainings and workshops for farmer to develop quantitative and qualitative farming methods.
- Conduct the monthly seminars to discuss and share about the progress as well as update the valuable issues about coconut farming.
- Kindly uphold the good qualitative outcome while selecting the coconut seeds for farming along with improves the coconut production level.
- Generate / promote the coconut production echelon to the universal competitive markets.
- Provide the global level inspirational audio and video visions to motivate the formers for cultivation as well as avoid the de-motivation of formers.

7. Conclusion:

Since of an economic importance, the coconut farming has developed in many nations all over the world, even in Karnataka state too productively cultivating the coconut farming as for the sustainable development in creative manner. Even this commercial farming system under agricultural aspect carried several emerging challenges it has a huge advantages in national and international markets. Especially for an environment support and inclusive involvement of farmers the Karnataka state got one of the top fifth ranking for coconut farming in national level. Fortunately, many NGOs and Government departments also come forward for an economic balanced implementation of coconut agriculture at Karnataka state.

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